New Jersey Assessment of Skills and Knowledge

2008

TECHNICAL REPORT

Grades 5-8

May 2009

PTM 1507.04

STATE BOARD OF EDUCATION

JOSEPHINE E. HERNANDEZ ……..Union
President

ARCELIO APONTE …….……..Middlesex
Vice President

RONALD K. BUTCHER ……....Gloucester

KATHLEEN A. DIETZ ……...Somerset

EDITHE FULTON ……..Ocean

ROBERT P. HANEY ……..Monmouth

ERNEST P. LEPORE ……..…….……..Hudson

FLORENCE McGINN …….Hunterdon

ILAN PLAWKER ……Bergen

DOROTHY S. STRICKLAND …….…...Essex

Lucille E. Davy, Commissioner
Secretary, State Board of Education

NJ ASK 2008 GRADES 5–8 TECHNICAL REPORT
TABLE OF CONTENTS

NJ ASK 2008 GRADES 5–8 TECHNICAL REPORT
TABLES and FIGURES

PART 1: INTRODUCTION

The purpose of this Technical Report is to provide information about the technical characteristics of the 2008 administration of the NJ ASK for grades 5, 6, 7, and 8. This report is intended for use by those who evaluate tests, interpret scores, or use test results for making educational decisions. It includes the following sections: test development, test administration, quality control procedures, scoring, standard setting, item and test statistics, scaling and equating, reliability, validity, and score reporting.

This report provides extensive detail about the development and operation of NJ ASK. The traditional concerns with a program are often labeled reliability and validity. The empirical reliability and validity of the assessments are reported explicitly in this document. While reliability (Part 9) is relatively straightforward, the steps in creating the program and putting it into operation are all aspects of validity (Part 10). The validity of any assessment stems from the steps taken in planning it, the processes of developing the content of the tests, the processes of consulting with stakeholders, the processes of communicating about the test to users, the processes of scoring and reporting, and the processes of data analysis. Each is an inherent part of validity.

Data for the analyses presented in this Technical Report were collected during the spring administration in April/May 2008. The short time duration between test administration and the standard setting meeting necessitated the use of a priority sample for the analyses presented in Part 6 – Standard Setting for the LAL, Spanish LAL, mathematics, and science assessments. In addition, scoring requirements (e.g., extensive writing tasks) and NCLB reporting timelines required the use of a subset of the total LAL student population for Part 8 – Scaling and Equating. However, the entire mathematics and science student population data were available for the scaling and equating analyses.

A priority sample consists of a sub-group (approximately 30%) of the entire state student population that contains a representative sample of students from across the state based on District Factor Group (DFG), ethnicity, and gender. The answer documents from the selected priority sample are scored and prioritized such that the results from this group are available for NCLB-timeline-driven-analyses. The entire student population test results were utilized in less time sensitive analyses such as those reported Part 7 – Item and Test Statistics and Part 9 – Reliability. The student N-counts are provided for each analysis in order for the reader to quickly determine whether the total student population or a sub-group was used for analyses.

In reading this technical report, it is critical to remember that the testing program does not exist in a vacuum; it is not just a test. It is one part of a complex network intended to help schools focus their energies on dramatic improvement in student learning. NJ ASK is an integrated program of testing, accountability, and curricular and instructional support. It can only be evaluated properly within this full context. Detailed descriptions of the 2008 NJ ASK 5-8 are provided in Sections 2.2 and 2.3. A discussion of the link between 2008 NJ ASK 5-8 and 2007 tests is provided in Section 8.4.

1.1 Description of the Assessment

The New Jersey Assessment of Skills and Knowledge (NJ ASK) was administered as operational assessments in Spring 2008 to students in grades five through eight. It consisted of two content areas in grades 5, 6, and 7, Language Arts Literacy (LAL) and mathematics, and three content areas in grade 8, LAL, mathematics, and science. The NJ ASK is designed to give an early indication of the progress students are making in mastering the knowledge and skills described in New Jersey's CCCS. In addition, these assessments fulfill the requirements under the No Child Left Behind (NCLB) Act.

In 2008, grades five through eight assessments were redesigned as NJ ASK 5-8. Grades five through seven of the new ASK 5-8 replaced the interim ASK 5-7 administered in 2006 and 2007. For grade eight, ASK 8 replaced the Grade Eight Proficiency Assessment (GEPA) marking 2007 as the last GEPA administration; however, the ASK 8 science test design remains unchanged from GEPA. New Jersey's statewide assessments currently include the following components:

Elementary School:

- Grade 3 New Jersey Assessment of Skills and Knowledge (ASK)
- Grade 4 New Jersey Assessment of Skills and Knowledge (ASK)

Middle School:

- Grade 5 New Jersey Assessment of Skills and Knowledge (ASK)
- Grade 6 New Jersey Assessment of Skills and Knowledge (ASK)
- Grade 7 New Jersey Assessment of Skills and Knowledge (ASK)
- Grade 8 New Jersey Assessment of Skills and Knowledge (ASK)

High School:

- High School Proficiency Assessment (HSPA)

In addition, the statewide assessment program currently includes two tests for special populations:

- Alternate Proficiency Assessment (APA), for students with the most significant cognitive disabilities
- Special Review Assessment (SRA), for students who have not demonstrated proficiency in one or more content areas of the HSPA

Please Note: The results of the redesigned NJ ASK 5-8 LAL and Mathematics cannot be compared with those of previous assessments due to changes in test design in 2008. It is important to note that the redesigned NJ ASK 5-8 for LAL and Mathematics differ significantly in terms of item type, passage length, and testing time. Therefore direct comparisons of student performance across these assessments are inappropriate.

The NJ ASK Language Arts Literacy, Mathematics and Science scores at grade 5–8 are reported as scale scores, with score ranges as follows:

- Partially Proficient 100–199
- Proficient 200–249
- Advanced Proficient 250–300

The scores of students who are included in the Partially Proficient level are considered to be below the state minimum of proficiency and those students may be most in need of instructional support. The standard-setting procedures used in 2008 for determining proficiency levels are detailed in Part 6 of this Technical Report.

1.2 Purpose of the Assessment

New Jersey's state-required assessment program was designed to measure the extent to which all students at the elementary-, middle-, and secondary-school levels have attained New Jersey's Core Curriculum Content Standards (CCCS).

As a result of the No Child Left Behind Act of 2001 (NCLB) requirements, New Jersey established additional statewide assessments in grade 3 through 8 and high school. The statewide assessments for elementary and middle school grades are administered annually as the New Jersey Assessment of Skills and Knowledge (NJ ASK) in language arts literacy and mathematics at grades 3 through 8, and in science at grades 4 and 8. Testing is conducted in the spring of each year to allow school staff and students the greatest opportunity to achieve the goal of Proficiency.

The results are to be used by schools and districts to identify strengths and weaknesses in their educational programs. It is anticipated that this process will lead to improved instruction and better alignment with the CCCS. The results may also be used, along with other indicators of student progress, to identify those students who may need instructional support in any of the content areas. This support, which could be in the form of individual or programmatic intervention, would be a means to address any identified knowledge or skill gaps.

1.3 NJ ASK Organizational Support

New Jersey's Office of State Assessments (OSA) coordinates the development and implementation of the NJ ASK 5–8. In addition to planning, scheduling, and directing all NJ ASK activities, the staff is extensively involved in numerous test reviews, security, and quality-assurance procedures. Measurement Incorporated (MI) is the contractor for NJ ASK grades 5-8. MI is responsible for all aspects of the testing program including activities such as program management, development of test materials (test booklets, answer documents, and ancillary materials), and psychometric support, including standard setting. MI's other activities include enrollment verification; distribution of all materials; receiving, scanning, editing, and scoring the answer documents; scoring constructed-response items; and creating, generating, and distributing all score reports of test results to students, schools, districts, and the state. MI also contributed to the development of test items for the 2008 NJ ASK 5-8; however, Riverside Publishing, Pearson, and other companies developed some items.

PART 2: TEST DEVELOPMENT

In 2008, grades five through eight assessments were redesigned as NJ ASK 5-8. The NJ ASK 8 Science Test design, however, remained the same as the GEPA Science Assessment. The revised NJ ASK 5-8 was administered for the first time as an operational test in 2008. The 2008 revisions included the following:

Overall

- NJ ASK Grade 8 replaced GEPA in LAL, mathematics, and science
- Revised NJ ASK grades 5, 6, and 7 replaced the interim ASK 5-7 administered in 2006 and 2007
- Spanish versions of the assessments in all content areas
- Test administered later in school year (May)

Language Arts Literacy (LAL):

- Reading passages – more, shorter in length, more diverse in content
- Writing prompts – two prompts
- More test items and score points in total

Mathematics

- Two days (grades 5-7) instead of one
- New item type: short constructed response (SCR)
- More test items and score points in total

MI content experts and the New Jersey Department of Education (NJ DOE) developed a directory of test specifications and sample items for each content area. These specifications describe the test, format of the items, and the scores to be generated by the test. This document serves as the foundation for all test item development.

MI and the NJ DOE rely upon their expertise and the CCCS to design a test that is universally accessible to all students in grades five through eight and is composed of test questions that are age- and grade-appropriate. The material in the test specifications is designed for use by curriculum specialists and teachers to improve instruction at the district, school, and classroom levels.

2.1 Test Specifications

The 2008 NJ ASK 5-8 was designed to measure the knowledge and skills identified in the 2004 revision of the NJ CCCS. Brief descriptions of the test content measured in LAL, mathematics, and science are presented in the following sections. Table 2.1.1 details the total possible points by grade and content area. Table 2.1.2 shows the skills assessed by each content cluster.

Language Arts Literacy

Language Arts Literacy (LAL) assessment focuses on a student's reading and writing knowledge and skills based on the NJ CCCS. The LAL test consists of reading passages, multiple-choice items, constructed-response items, and writing tasks. The LAL score is reported in two content clusters: Reading (standard 3.1) and Writing (standard 3.2).

- **Reading** (3.1)
  - Working with or Interpreting Text
  - Analyzing and Critiquing Text
- **Writing** (3.2)
  - Persuasive
  - Speculative (text-based)

Reading. The Reading cluster of the test requires that students read passages selected from previously published work and respond to related multiple-choice and constructed-response items. The constructed-response questions are designed to measure a student's comprehension of the reading selection/passage. Students must write their own response using examples and/or information from the reading.

There are two types of reading passages on the NJ ASK 5-8: narrative and informational reading.

- Narrative Reading
  - Literature written primarily to tell a story
  - Selections from previously published works
  - 500 – 1,000 words in length (approximate)
- Informational Reading
  - Nonfiction text written to convey information
  - Selections from previously published materials
  - 400 – 900 words in length (approximate)

The Reading cluster targets the following skill areas: Working with/Interpreting Text and Analyzing/Critiquing Text.

Working with/Interpreting Text involves strategies that interpret or reformulate meaning from text:

- Recognizing central idea or theme
- Recognizing supporting details
- Extrapolating information/following directions
- Paraphrasing/retelling (vocabulary)
- Recognizing text organization
- Recognizing a purpose for reading

Analyzing/Critiquing Text involves strategies to analyze and critique text:

- Questioning, clarifying, predicting
- Predicting tentative meanings
- Forming opinions about text and author's techniques
- Making judgments/drawing conclusions
- Interpreting textual conventions and literary elements

Writing. All tasks in the Writing cluster require that students write a response that is subsequently scored using the NJ Registered Holistic Scoring Rubric. The Writing cluster consists of writing tasks in response to two types of prompts:

- Persuasive prompt
- Speculative prompt

Persuasive writing prompts elicit students' points of view or opinions of a given controversy. The controversies presented can be interpersonal, school/community-related, or societal in nature.

Speculative writing prompts present students with a briefly described situation to which they are required to respond with a narrative. The given situation provides students with information that may be used as a springboard for students to write a story, actual or fictional. Students use the information from the text to make decisions, solve problems, and create original works. Students construct a narrative or story based on the given writing prompt or some aspect of that prompt.

Please note: Scores from the two readers of the Persuasive prompt are summed and thus weighted more heavily in calculating the total score as examinees are given 45 minutes to complete the Persuasive prompt. Whereas, scores from the Speculative prompt are averaged because the examinees are allotted only 25 minutes to complete this writing task.

A Writer's Checklist is provided to students during testing to encourage students to read, reread, revise, and edit their written work for all writing tasks.

Mathematics

The Mathematics test measures students' ability to solve problems by applying mathematical concepts. The Mathematics component measures knowledge and skills in four content clusters corresponding to standards. These content clusters/standards and their associated strands are enumerated below:

4.1. Number and Numerical Operations

A. Number Sense
B. Numerical Operations
C. Estimation

4.2. Geometry and Measurement

A. Geometric Properties
B. Transforming Shapes
C. Coordinate Geometry
D. Units of Measurement
E. Measuring Geometric Objects

4.3. Patterns and Algebra

A. Patterns
B. Functions and Relationships
C. Modeling
D. Procedures

4.4. Data Analysis, Probability, and Discrete Mathematics

A. Data Analysis (Statistics)
B. Probability
C. Discrete Mathematics--Systematic Listing and Counting
D. Discrete Mathematics--Vertex-Edge Graphs and Algorithms

Mathematics contains both multiple-choice and constructed-response items. There are two types of constructed-response items: extended constructed-response (previously known as open-ended) and short constructed-response. The extended constructed-response items require students to solve a problem as well as explain their solution. The short constructed-response items only require an answer, not an explanation. The multiple-choice and extended constructed-response items may be answered with the use of a calculator. The short constructed-response items must be answered without the use of a calculator in grades 5 and 6 and may be answered with a calculator in grades 7 and 8.

Some mathematics items are also classified and reported as Problem Solving which means that the items require problem solving skills in applying mathematical concepts (for example: solving, applying, reasoning, communicating, modeling, constructing, etc.).

Problem Solving items are defined based on the Mathematical Processes standard of the NJ CCCS: **"**Problem posing and problem solving involve examining situations that arise in mathematics and other disciplines and in common experiences, describing these situations mathematically, formulating appropriate mathematical questions, and using a variety of strategies to find solutions. Through problem solving, students experience the power and usefulness of mathematics. Problem solving is interwoven throughout the grades to provide a context for learning and applying mathematical ideas."

Science

The science test measures eighth-grade students' ability to recall information and to solve problems by applying science concepts. The science test assesses knowledge and application skills in three clusters; each cluster contains multiple-choice items and constructed-response items. The CCCS standard numbers corresponding to the three clusters are indicated in parentheses.

- **Life Science** (5.5, 5.10)
  Matter, Energy, and Organization in Living Systems
  Diversity and Biological Evolution
  Reproduction and Heredity
  Natural Systems and Interactions
  Human Interactions and Impact
- **Physical Science** (5.6, 5.7)
  Structure and Properties of Matter
  Chemical Reactions
  Motion and Forces
  Energy Transformations
- **Earth Science** (5.8, 5.9)
  Earth's Properties and Materials
  Atmosphere and Weather
  Processes that Shape the Earth
  How We Study the Earth
  Earth, Moon, Sun System
  Solar System
  Stars
  Galaxies and Universe

Science items are also classified and reported as either

- Knowledge (Comprehension and Science, Society/Technology), or
- Application (Habits of Mind/Inquiry and Mathematics)

For the complete description of the 2008 NJ ASK 5-8 test redesign, visit the following page on the NJ DOE Web site:
http://www.state.nj.us/education/assessment/updates/update111607.pdf

For the full text of the NJ CCCS, please visit the following page on the NJ DOE Web site:
http://www.nj.gov/education/cccs/

Table 2.1.1: 2008 NJ ASK 5-8 Total Points Possible by Content Area

Language Arts Literacy	Grade 5	Grade 6	Grade 7	Grade 8
Total	**75 points**	**78 points**	**78 points**	**78 points**
Writing	15	18	18	18
Persuasive Prompt (score summed)	10	12	12	12
Speculative Prompt (score averaged)	5	6	6	6
Reading	60	60	60	60
Working with Text	23	24	25	30
Analyzing Text	37	36	35	30
Mathematics	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
Total	**50 points**	**50 points**	**52 points**	**52 points**
Number & Numerical Operations	12	12	13	13
Geometry & Measurement	12	12	13	13
Patterns & Algebra	13	13	13	13
Data Analysis, Probability, & Discrete Mathematics	13	13	13	13
Problem Solving	*27*	*29*	*26*	*37*
Science	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
Total	**-**	**-**	**-**	**54 points**
Life Science	-	-	-	21
Physical Science	-	-	-	16
Earth Science	-	-	-	17
Knowledge	-	-	-	*9*
Application	-	-	-	*45*

Table 2.1.2: 2008 NJ ASK 5-8 Number of Items by Content Cluster and Skill

Language Arts Literacy*	Grade 5		Grade 6		Grade 7		Grade 8	
Skill	**W**	**A**	**W**	**A**	**W**	**A**	**W**	**A**
Writing	0	0	0	0	0	0	0	0
Reading	17	25	21	21	22	20	24	18
Total	**17**	**25**	**21**	**21**	**22**	**20**	**24**	**18**
Mathematics**	**Grade 5**		**Grade 6**		**Grade 7**		**Grade 8**	
Skill	**PS**	**NC**	**PS**	**NC**	**PS**	**NC**	**PS**	**NC**
Number & Numerical Operations	4	6	7	3	6	5	8	3
Geometry & Measurement	4	6	4	6	4	7	6	5
Patterns & Algebra	6	5	5	6	4	7	8	3
Data Analysis, Probability, & Discrete Mathematics	5	6	5	6	4	7	7	4
Total	**19**	**23**	**21**	**21**	**18**	**26**	**29**	**15**
Science***							**Grade 8**	
Skill							**K**	**A**
Life Science							15	4
Physical Science							12	2
Earth Science							12	3
Total							**39**	**9**

*W = Working with Test, A = Analyzing Text **PS= Problem Solving, NC = Not Classified
***K = Knowledge, A = Application

Test Blueprints

The following tables outline the test construction blueprints. The actual test map for each grade and content area for the 2008 NJ ASK 5-8 is included.

Table 2.1.3: Test Construction Map for NJ ASK 5-8 Language Arts Literacy

NJ ASK 5-8 Language Arts Literacy

Text types/Strand	Reading Selections	MC (Number of Items)	OE (Number of Items)	Writing Tasks (Number of Items)	Total Points	Time on Task(s) in Approximate Minutes
Persuasive Prompt				1	10-12**	45
Speculative Prompt				1	5-6**	25
Narrative Reading	2	20	4		36	80
AT* per passage		4-6				
WT* per passage		4-6				
Informational Text Reading	2	16	2		24	60
AT* per passage		3-5				
WT* per passage		3-5				
Total Items		36	6	2		
Total Points by Item Type		36	24	15-18	75-78	
Total LAL Testing Time						2 days, 2 hrs. per day (with field test)

*AT: Analyzing Text; WT: Working with Text

**Grade 5 utilizes a 5 point scoring rubric; grades 6-8 utilize a 6 point rubric.

Table 2.1.4: Actual Test Map for 2008 Grade 5 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
A	**1**	0	0	0	0
	2	2	1	3	6
	3	4	2	6	12
	4	12	1	13	16
	5	3	0	3	3
A Total		**21**	**4**	**25**	**37**
W	**1**	4	1	5	8
	2	3	1	4	7
	3	4	0	4	4
	4	2	0	2	2
	5	1	0	1	1
	6	1	0	1	1
W Total		**15**	**2**	**17**	**23**
WRITE	SPECULATIVE		1	1	5
WRITE	PERSUASIVE		1	1	10
Total Writing			**2**	**2**	**15**
Grand Total		**36**	**8**	**44**	**75**

Table 2.1.5: Actual Test Map for 2008 Grade 6 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
A	**1**	1	1	2	5
	2		1	1	4
	3	1	2	3	9
	4	10	1	11	14
	5	4		4	4
A Total		***16***	***5***	***21***	***36***
W	**1**	4	1	5	8
	2	5		5	5
	3	6		6	6
	4	1		1	1
	5	3		3	3
	6	1		1	1
W Total		20	1	**21**	**24**
WRITE	SPECULATIVE		1	1	6
WRITE	PERSUASIVE		1	1	12
Total Writing			***2***	***2***	***18***
Grand Total		**36**	**8**	**44**	**78**

Table 2.1.6: Actual Test Map for 2008 Grade 7 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
A	**1**			0	0
	2	4		4	4
	3	1	2	3	9
	4	4	3	7	16
	5	6		6	6
A Total		***15***	***5***	***20***	***35***
W	**1**	4		4	4
	2	2	1	3	6
	3	4		4	4
	4	3		3	3
	5	4		4	4
	6	4		4	4
W Total		***21***	***1***	***22***	***25***
WRITE	SPECULATIVE		1	1	6
WRITE	PERSUASIVE		1	1	12
Total Writing			***2***	***2***	***18***
Grand Total		**36**	**8**	**44**	**78**

Table 2.1.7: Actual Test Map for 2008 Grade 8 Language Arts Literacy NJ ASK

CLUSTER	MACRO	MC (1 pt.)	CR (4 pts.)	# of Items	# of Points
A	**1**			0	0
	2	4		4	4
	3		4	4	16
	4	5		5	5
	5	5		5	5
A Total		*14*	*4*	***18***	***30***
W	**1**	3		3	3
	2	3	1	4	7
	3	5	1	6	9
	4	6		6	6
	5	3		3	3
	6	2		2	2
W Total		***22***	***2***	***24***	***30***
WRITE	SPECULATIVE		1	1	6
WRITE	PERSUASIVE		1	1	12
Total Writing			***2***	***2***	***18***
Grand Total		**36**	**8**	**44**	**78**

Table 2.1.8: Test Construction Map for NJ ASK 5-8 Mathematics

NJ ASK 5-8
Mathematics

Item Type Abbreviations

MC - multiple choice, 1 raw score point
SCR - short constructed response, 1 raw score point
ECR – extended constructed response, 3 raw score points

		Grade 5	Grade 6	Grade 7	Grade 8
Item Count by Type	MC	42	42	42	42
	SCR	8 (non-calculator)	8 (non-calculator)	10	10
	ECR	5	5	5	5
# of sections		5	5	5	5
Total raw score points possible (excluding field test items)		50	50	52	52
Approximate total testing time		120 min.	120 min.	124 min.	133 min.

Table 2.1.9: Actual Test Map for 2008 Grade 5 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	2	1	1	4	6
	B	3		1	4	4
	C	2			2	2
1 Total		***7***	***1***	***2***	***10***	***12***
2	A	2			2	2
	B	1			1	1
	C	1		1	2	2
	D	2		1	3	3
	E	1	1		2	4
2 Total		***7***	***1***	***2***	***10***	***12***
3	A	2	1	1	4	6
	B	2			2	2
	C	3			3	3
	D	2			2	2
3 Total		***9***	***1***	***1***	***11***	***13***
4	A	2	1		3	5
	B	3			3	3
	C	2		1	3	3
	D	2			2	2
4 Total		***9***	***1***	***1***	***11***	***13***
Grand Total		**32**	**4**	**6**	**42**	**50**

Table 2.1.10: Actual Test Map for 2008 Grade 6 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	3	1		4	6
	B	2		2	4	4
	C	2			2	2
1 Total		*7*	*1*	*2*	*10*	***12***
2	A	2	1	1	4	6
	B			1	1	1
	C	2			2	2
	D	2			2	2
	E	1			1	1
2 Total		*7*	*1*	*2*	*10*	***12***
3	A	2	1		3	5
	B				0	0
	C	5		1	6	6
	D	2			2	2
3 Total		*9*	*1*	*1*	*11*	***13***
4	A	4		1	5	5
	B	1			1	1
	C	3	1		4	6
	D	1			1	1
4 Total		*9*	*1*	*1*	*11*	***13***
Grand Total		**32**	**4**	**6**	**42**	**50**

Table 2.1.11: Actual Test Map for 2008 NJ ASK Grade 7 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	3			3	3
	B	3	1	1	5	7
	C	2		1	3	3
1 Total		*8*	*1*	*2*	*11*	***13***
2	A	2	1	1	4	6
	B	2		1	3	3
	C	1			1	1
	D	1			1	1
	E	2			2	2
2 Total		*8*	*1*	*2*	*11*	***13***
3	A	1		1	2	2
	B	1			1	1
	C	3	1		4	6
	D	3		1	4	4
3 Total		*8*	*1*	*2*	*11*	***13***
4	A	2		1	3	3
	B	3			3	3
	C			1	1	1
	D	3	1		4	6
4 Total		*8*	*1*	*2*	*11*	***13***
Grand Total		**32**	**4**	**8**	**44**	**52**

Table 2.1.12: Actual Test Map for 2008 NJ ASK Grade 8 Mathematics NJ ASK

STANDARD	STRAND	MC (1 pt.)	ECR (3 pts.)	SCR (1 pt.)	# of Items	# of Points
1	A	3			3	3
	B	3	1	1	5	7
	C	2		1	3	3
1 Total		*8*	*1*	*2*	*11*	***13***
2	A	2			2	2
	B	2		1	3	3
	C	1		1	2	2
	D	2			2	2
	E	1	1		2	4
2 Total		*8*	*1*	*2*	*11*	***13***
3	A	2	1	1	4	6
	B	2			2	2
	C	2			2	2
	D	2		1	3	3
3 Total		*8*	*1*	*2*	*11*	***13***
4	A	2		1	3	3
	B	2		1	3	3
	C	2			2	2
	D	2	1		3	5
4 Total		*8*	*1*	*2*	*11*	***13***
Grand Total		**32**	**4**	**8**	**44**	**52**

Table 2.1.13: Actual Test Map for 2008 NJ ASK Grade 8 Science NJ ASK

Cluster	Cog/Prob	MC (1 pt.)	CR (3 pts.)	# of Items	# of Points
Earth	A	11	1	12	14
	K	3		3	3
Earth Total		*14*	*1*	*15*	***17***
Life	A	14	1	15	17
	K	4		4	4
Life Total		*18*	*1*	*19*	***21***
Physical	A	11	1	12	14
	K	2		2	2
Physical Total		*13*	*1*	*14*	***16***
Grand Total		**45**	**3**	**48**	**54**

2.2 Development of Test Items

The NJ ASK consists of two types of items:

1. Operational or base test items used to determine students' scores and
2. Field-test items evaluated for use as future base test items.

Items used in the 2008 assessments originated from a variety of sources. During 2007, Measurement Incorporated (MI) developed LAL and mathematics items in grades five through eight in order to meet the new requirements of the NJ ASK. Approximately 300 of these items were administered in a stand-alone field test in the fall of 2007 and 123 of those items appeared on the 2008 NJ ASK. Items on the stand-alone field test are described in Table 2.2.1.

Table 2.2.1: 2007 NJ ASK 5-8 Fall Stand-Alone Field Test – Item Types

Content Area	Item Type	Description	Point Value
LAL	Writing Tasks	Students are given a Persuasive of Speculative writing prompt to which they are required to respond	0 – 5 (grade 5) 0 – 6 (grade 6)
	Constructed Response (CR)	Students are required to supply an extended response in a short essay format.	0 - 4
	Multiple-Choice (MC)	Students are given a stem (beginning of a statement) or question and four answer choices from which to choose in order to complete the statement or answer the question	0 - 1
Math	Short Constructed Response (SCR)	Students are required to supply a one word or very short response	0 - 1
	Extended Constructed Response (ECR)	Students are required to supply an extended response in a short essay format.	0 - 3
	Multiple-Choice (MC)	Students are given a stem (beginning of a statement) or question and four answer choices from which to choose in order to complete the statement or answer the question	0 - 1

Other sources of items on the redesigned 2008 NJ ASK 5-8 are detailed below:

- Grade 7 LAL items from EWT/GEPA Bank (9 items)
- Grade 8 LAL, mathematics, and science items from the Pearson Bank (106 items)
- Grades 5-7 LAL and mathematics items field tested spring 2007 by Riverside (114 items)
- Grades 5-7 LAL items rented from Riverside (42 items)

In the item development process, MI developed test and item specifications based upon requirements of the New Jersey Core Curriculum Content Standards (CCCS). All items developed and field tested by MI for the 2008 NJ ASK went through the following steps of the item development process:

- MI wrote items to ASK standards
- MI content experts reviewed items
- NJ state content experts reviewed items
- NJ teachers and a sensitivity committee reviewed items to determine whether items can be field-tested
- Range-finding committee involving state educators reviewed items before scoring;
- Items field-tested with New Jersey students (Fall 2007)
- State content experts, NJ teachers, and a sensitivity committee reviewed again after field-testing.
- Approved items placed in item bank

Similar item development processes were utilized by Riverside Publishing and Pearson. The specifics of the Riverside Publishing item development process are detailed below. The item development processes of these companies are germane to item development for 2008 NJ ASK as many of the items developed by these organizations compose the 2008 NJ ASK.

- Riverside: Created test and item specifications based on requirements of state
- Riverside: Selected and trained item writers
- Item Writers: Wrote test items
- Riverside: Conducted initial item review
- Riverside: Conducted item review by experienced senior staff
- Riverside: Conducted content and bias review with committees comprised of educators.
- Field-tested items with New Jersey students (1998), with Ohio students, or with Georgia students.
- Riverside: Conducted Statistical Item Review

In December 2005, January 2006, and fall of 2006 the following additional development processes were undertaken.

- Riverside: Aligned items to the CCCS
- NJ DOE: Approved alignment of items, including the balance of standards reflected in the test blueprint; also improved item quality.
- Removed all items that did not have NJ DOE approval for adherence to the CCCS

Only an item that has been found acceptable at every stage of the cycle is entered into the bank for possible use on an operational test. Although statistical data on test items play an essential role, this cycle of development employs a due process model of validity. This model relies on the expertise of educators participating in the test development process. The strength of this process is dependent on the degree to which the following critical components are integrated into the test development process:

- Recruitment of expert educators familiar with the state's content specifications and population for the assessment;
- Training of item writers and expert reviewers on item writing specifications, content specifications, and the goals and functions of the assessment;
- Careful consideration of individual items by experts to assess the degree to which the items measure the knowledge, skills, and abilities the assessment is intended to measure with opportunities to reject or revise items per committee recommendation; and
- Careful consideration of sensitivity issues by experts to guarantee that performance on the item is related to classroom achievement and not cultural or social experiences outside the classroom with opportunities to reject or revise items per committee recommendation.

At MI, item writers, under the supervision of content experts, are instructed on the state specifications and item types necessary for the tests. They are trained on the ASK content specifications and directed to write original items tailored to NJ content standards. Content expert reviewers at MI validate (or not) the initial coding of items by item writers to meet ASK content standards. At this point in the process, some items are rejected from further consideration on the grounds that the items are not tied closely enough to ASK standards or are not at an appropriate level of difficulty.

When NJ educators review items, they look beyond the item wording and scoring rubric. In mathematics, teachers validate an assignment of each item to a NJ content specification Standard and Strand using the same standards used for the ASK. Teachers also review an item assignment to a Knowledge or Problem-solving category. LAL committee members review the type of passage and skill cell of each LAL item. For all content review meetings, MI furnished reviewers with copies of the NJ skill code (LAL) and Strand-Standard (MATH and SCI) sheets to allow committee members to validate assignment of items to NJ content standards. Reviewers may accept or revise an item coding assignment, or reject an item as not fulfilling any specific part of the content specifications. For each item, both committees also rate each item for a level of difficulty.

All test items are field tested and reviewed again before they can be used as operational test items. For the statistical item review, the Mantel-Haenszel statistic is calculated to show whether or not students are responding to an item in a way that their overall ability (as measured by the base test) would lead us to expect. The statistic allows the committees to examine group membership (by ethnicity or by gender). The Mantel-Haenszel statistic is used for a classification determination of category A, B, or C. An item in Category A shows no or minor relationship between group membership and performance. Category B items show small to moderate relationship between membership and performance. Category C items show a substantial relationship between group membership and item performance and must be examined carefully by the committees to make sure these items are not biased.

Although the content committees are trained to recognize possible bias or lack of cultural sensitivity in test items, a separate sensitivity committee meets to review LAL passages

before field-testing to identify potential item bias. After field-testing, the same committee reviews all MC and CR items flagged as Mantel-Haenszel "C" items (probable DIF) in LAL, mathematics, and science using student data disaggregated by demographic group for all tests. Like the content committee, the sensitivity committee has the power to reject an item. If either the sensitivity committee or content committee rejects an item, it is considered rejected. If one requires that the item be revised, that decision outweighs an acceptance by the other committee.

Each field tested item has a Mantel-Haenszel statistics for each of three comparisons that New Jersey student population will support. A White/African American, White/Hispanic, and Male/Female comparison for each item is done with sample sizes for the focus group (African Americans, Hispanic, or Females) greater than 500. A small number of the 2008 NJ ASK operational items were flagged as Mantel-Haenszel "C" items. All of these items were reviewed by the sensitivity committee and none appeared to exhibit bias.

At item review sessions, items are presented one-per-page with the footer below.
This footer is used for LAL, mathematics, and science.

Sensitivity	Content
*Comments:	*Comments:
Sensitivity Issue Yes No	Meets Specifications Yes No
If yes, identify category and explain*	Appropriate Difficulty Yes No
	Accurate Coding Yes No
Definitely Use	Definitely Use
Revise and Use With Approval	Revise and Use With Approval
Revise and Resubmit	Revise and Resubmit
Do Not Use*	Do Not Use*

At the bottom of each footer there is a place for committee members to sign off on their decision:

_____ _____

Sensitivity Sign-off Date Content Chairperson's Signature Date

This is a critical step in the item review process as it records, item by item, the appropriateness of each item for the assessment. Only an item approved by both committees can be field-tested.

Operational Test Form Distribution

The 2008 operational tests consisted of 14 forms per grade in grades 5 through 7 and 18 forms in grade 8. Each of the test forms at each grade level included identical base test items as well as embedded field test items for LAL, mathematics, and science. Note that students earned scores only on the identical common items. These forms were distributed to New Jersey school districts so that each district has one and only one test form, except in the case of unusually large districts (Jersey City, Newark, and Patterson) which received two forms. Furthermore, the test forms were distributed across DFG classifications, such that each DFG was represented across each form. Finally, approximately equal numbers of students (approximately 9,000 at grades 5 – 7 and 7,000 at grade 8) were given each test form. Tables 2.2.2 – 2.2.5 illustrate the final operational test distribution, by grade, test form, and DFG classification.

Table 2.2.2: Grade 5 Operational Test Form Distribution Plan
2008 NJ ASK

DFG	Form														
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**O**	**Grand Total**
A	1144	1747	1700	1206	1360	1300	1361	1591	1363	1360	1655	1211	1603	1459	20060
B	1010	740	869	940	1105	1187	820	920	810	881	760	891	900	810	12643
CD	840	600	870	780	800	850	769	860	962	900	960	779	729	882	11581
DE	1180	1121	1040	1030	1201	1000	1292	1111	1160	1110	1010	1519	980	1101	15855
FG	1241	1050	1121	1050	1069	1050	1130	1101	1091	1109	1138	1061	1070	1179	15460
GH	1139	1199	1200	1310	1130	1150	1171	1130	1129	1220	1189	1160	1270	1190	16587
I	1710	1640	1651	1599	1610	1651	1632	1741	1630	1622	1751	1588	1561	1690	23076
J	240	440	331	521	200	530	370	350	510	330	120	880	220	240	5282
N	30												490		520
O	150	70	100	110	100	122	120	110	120	130	130	90	120	110	1582
R	180	100	180	170	220	180	160	160	190	200	180	180	200	180	2480
S	20	52	40	50	20	40	72	30	20	20	40	20	20	69	513
V			0								20		20		40
Grand Total	8884	8759	9102	8766	8815	9060	8897	9104	8985	8882	8953	9379	9183	8910	125679

Table 2.2.3: Grade 6 Operational Test Form Distribution Plan
2008 NJ ASK

DFG	Form														
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**O**	**Grand Total**
A	1177	1619	1721	1126	1420	1220	1310	1591	1141	1390	1357	1071	1448	1451	19042
B	960	750	869	830	1136	1116	810	900	820	810	740	841	530	830	11942
CD	880	580	920	830	820	841	770	780	860	1040	950	802	690	790	11553
DE	1210	990	1020	1040	1179	1020	1190	1140	1190	1091	1470	1470	1089	1161	16260
FG	1190	1080	1180	1129	960	980	1100	1159	1090	1100	1120	1051	1131	1080	15350
GH	1070	1200	1240	1159	1180	1140	1161	1230	1080	1180	1210	1120	1340	1240	16550
I	1640	1540	1600	1560	1680	1800	1680	1650	1600	1540	1720	1540	1530	1690	22770
J	290	430	310	510	160	490	350	300	470	300	120	880	230	240	5080
N	30												479		509
O	150	70	120	90	100	142	100	120	140	200	150	80	130	150	1742
R	100	50	180	290	200	140	140	170	250	150	240	180	180	180	2450
S	20	52	40	60	20	40	90	50	30	20	70	20	20	69	601
V			30								20		30		80
Grand Total	8717	8361	9230	8624	8855	8929	8701	9090	8671	8821	9167	9055	8827	8881	123929

Table 2.2.4: Grade 7 Operational Test Form Distribution Plan
2008 NJ ASK

DFG	Form														
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**O**	**Grand Total**
A	1256	1639	1784	1093	1220	1210	1340	1560	1111	1420	1450	1039	1561	1360	19043
B	820	760	1280	860	1123	1267	720	1120	840	1200	820	660	570	710	12750
CD	800	650	660	820	770	830	790	1050	970	1070	1020	821	680	770	11701
DE	1550	1080	1030	1010	1250	1030	1200	750	960	930	960	1530	1620	980	15880
FG	1260	1400	1230	1240	1061	840	1150	1070	1020	1131	1170	1570	1150	1109	16401
GH	950	1211	1190	1260	1100	860	1440	1220	1010	940	1620	1180	1400	1020	16401
I	1730	1530	1610	1620	1580	1990	1650	1640	1590	1590	1570	1520	1510	1681	22811
J	280	380	280	480	210	490	400	100	490	290	120	880	240	220	4860
N	30								440				0		470
O	140	80	120	110	239	230	80	120	170	200	160	90	150	180	2069
R	100	50	180	300	110	210	160	190	250	110	230	180	180	170	2420
S	30	39	40	50	20	30	52	40	51	40	90	20	20	99	621
V			30								20		20		70
Grand Total	8946	8819	9434	8843	8683	8987	8982	8860	8902	8921	9230	9490	9101	8299	125497

Table 2.2.5: Grade 8 Operational Test Form Distribution Plan
2008 NJ ASK

DFG	Form										
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**
A	1245	1659	1730	1156	930	860	911	1010	930	870	810
B	570	370	400	730	1123	1258	520	740	570	860	560
CD	759	580	630	560	650	680	860	630	980	630	500
DE	810	1040	850	880	990	850	1190	800	910	660	970
FG	730	850	800	1130	920	830	900	960	750	710	990
GH	910	1100	920	660	1350	780	950	940	961	910	850
I	1260	1230	1190	1450	1160	1170	1120	1190	1410	1170	1450
J	240	380	200	470	60	480	190	260	460	330	210
N	0	0	0	0	0	0	0	0	0	0	0
O	160	100	100	120	110	152	70	110	130	180	160
R	100	90	110	130	100	130	140	130	170	120	130
S	30	0	70	20	0	20	79	50	30	30	91
V	0	0	40	0	0	0	0	0	0	0	0
Grand Total	6814	7399	7040	7306	7393	7210	6930	6820	7301	6470	6721

DFG	Form							
	M	**N**	**O**	**P**	**R**	**S**	**T**	**Grand Total**
A	969	960	1049	970	861	780	1571	19271
B	640	870	700	600	770	620	660	12561
CD	850	640	590	600	770	560	530	11999
DE	1510	760	901	900	760	700	690	16171
FG	380	1280	1140	860	980	880	940	16030
GH	961	779	890	850	1230	770	920	16731
I	1420	1110	1280	1240	1440	1260	1100	22650
J	180	150	110	900	130	90	100	4940
N	0	0	0	0	0	420	30	450
O	100	150	160	130	150	369	150	2601
R	150	130	70	110	140	120	140	2210
S	0	20	99	39	20	20	40	658
V	0	38	0	0	0	0	0	78
Grand Total	7160	6887	6989	7199	7251	6589	6871	126350

2.3 Item Review Process

Following a field test, the NJ DOE conducts a statistical analysis review session with New Jersey teachers. The teachers on the content and sensitivity committees review the items and evaluate the performance of the items based on field test data. The following variables are included:

Item ID
N-count
p-value
Biserial
% answering each option (A-D) and omits
p-value for bottom 20%
p-value for top 20%
% of Whites answering each option (A-D) and omits; N-count for Whites
% of Blacks answering each option (A-D) and omits; N-count for Blacks
% of Hispanics answering each option (A-D) and omits; N-count for Hispanics
% of Males answering each option (A-D) and omits; N-count for Males
% of Females answering each option (A-D) and omits; N-count for Females
Total Reading Score for students taking that form
Total Writing Score for students taking that form
CR items' mean score
Correlation of each CR item with total reading score
Correlation of each CR item with total writing score
CR item score distribution, frequency, percent, mean, and standard deviation for total group
CR item score distribution, frequency, percent, mean, and standard deviation for Whites
CR item score distribution, frequency, percent, mean, and standard deviation for Blacks
CR item score distribution, frequency, percent, mean, and standard deviation for Hispanics
CR item score distribution, frequency, percent, mean, and standard deviation for Males
CR item score distribution, frequency, percent, mean, and standard deviation for Females
Mantel-Haenszel statistics

For the meeting, teachers are provided with a training session on how to interpret these statistics. To draw their attention to items that may be problematic, several flags are used. The flags include:

Difficulty flag to indicate that an item has a *p*-value less than .25 or greater than .95
Correlation flag to indicate an item that has an item-total correlation of less than .25
Mantel-Haenszel flags to indicate any group comparison flagged as "C" using the standard ETS coding of Mantel-Haenszel results into A, B, C.

At the statistical review meetings, teachers are presented with forms similar to those used at initial item development meetings. The teachers must decide whether to:

- **Accept (Definitely Use):** All content related issues (importance, thematic, grammar, clarity, accuracy, validity, sound measurement, grade-appropriate), all statistical criteria, and all sensitivity issues have been met or exceeded and the item appears suitable for

operational use.

- **Revise (Revise and Re-Field Test):** One or more of the content related issues have not been met or the item needs minor changes to make it acceptable. Reviewers provide recommendations on changes to be made to the item that will make the item suitable for re-field testing.
- **Reject (Do Not Use):** Several content related issues, statistical criteria, or sensitivity issues have not been met, or are suspect, or need radical changes to make the item acceptable. In such cases, the item may be vague or ambiguous, inappropriate, or not clearly related to the text or to the standard. Without severe modifications, it is unlikely to be salvaged. Reviewers provide comments as to why the item should be rejected.
- **Revise and Use With Approval:** A very minor content related issue needs to be resolved and the NJ DOE content representative feels it is minor enough to use operationally without re-field testing.

Only items designated as revise and use with approval or accepted by both committees are added to the item bank for possible use on future operational tests. The decision regarding each item must be recorded on forms like the following:

ITEM CODE AND KEY	**Admin: March 2008**	**Form:**	**Position:**
***Comments**		***Comments**	
Sensitivity Issue	☐ **Yes** ☐ **No**	**Appropriate Difficulty**	☐ **Yes** ☐ **No**
If a sensitivity issue, explain* **Mantel-Haenszel Category C □ W-AA □ W-H □ M-F**		P-value = Biserial =	

☐	**Definitely Use**	☐
☐	**Revise and Use With Approval ****	☐
☐	**Revise and Re-Field Test**	☐
☐	**Do Not Use ***	☐

Sensitivity Sign-Off	**Date**	**Content Chairperson's Signature**	**Date**

**** Requires director's approval**

2.4 Item Use

All field-test items, approved for use on an operational test form, are moved into the item bank. Test development staff members choose from the available banked items when building an operational test form. In most cases, a test item is used operationally one time, unless the item is used a second time as an anchor item. After operational use, items are generally retired.

2.5 Test Forms Assembly

There are four steps associated with assembling test forms for NJ ASK:

1. Determine form design
2. Select items that meet content specifications
3. Evaluate statistical specifications and select items to meet these specifications
4. Review and approve test forms

1. **Determine form design** – Each form consists of a set of operational items along with embedded field test items.

2. **Select items that meet content specifications** – Each content area contains subsets of items called clusters.

    a. LAL includes two clusters: Writing (Writing about a Persuasive Prompts or Writing about a Speculative prompt) and Reading (Working with or Interpreting Text and Analyzing or Critiquing Text).

    b. Mathematics includes four clusters: Number and Numerical Operations; Geometry and Measurement; Patterns and Algebra; and Data Analysis, Probability, and Discrete Mathematics. Some mathematics items are also classified and reported as Problem Solving which means that the items require problem solving skills in applying mathematical concepts.

    c. Science includes three clusters: Life, Physical, and Earth Sciences. In addition, items are classified and reported as Knowledge or Application which means the item requires recalling factual information or applying scientific concepts.

Future test forms must be similar to previous forms in terms of the number of items, the number of points, and the distribution of the content.

3. **Evaluate statistical specifications and select items to meet these specifications** – Statistical specifications based on previous forms provide guidelines for building new test forms. These data are reviewed to make certain that current forms are not substantially harder or easier than previous forms. Linking designs are also evaluated at this stage.

4. **Final approval of forms** – Once the content and statistical specifications have been met for each grade and subject, and approved internally within MI, the forms are approved by the NJ DOE. The forms are then released for editorial reviews then production.

Checklists and quality control procedures accompany each stage of forms development. A checklist for forms development is attached as Appendix A.

PART 3: TEST ADMINISTRATION

Great care is taken to assure standard administration of the NJ ASK. Close attention to details is necessary to ensure that a student taking the test in one location has an equal opportunity to succeed as a student at another location. Information about the administration of NJ ASK is available in the Test Coordinator Manual **(***New Jersey Assessment of Skills & Knowledge Spring 2008 Test Coordinator Manual Grades 5–8)***.** That information will not be fully replicated here, but the following elements are of importance to this technical report.

3.1 Participation

State regulations require that all students be included in the statewide assessment program and assessed annually. This includes limited English proficient (LEP) students and students with disabilities. Beginning in school year 2001–2002, students with severe cognitive disabilities were administered the Alternative Proficiency Assessment (APA) for the first time statewide.

All public schools, including those without assessed grades, are counted into the state's accountability system. All schools without assessed grades are counted as one unit with their respective receiving schools. This helps ensure closer vertical alignment of instructional services. In addition, special education students served in proprietary schools are counted in the sending schools' accountability results, which ensure that placement decisions are reviewed closely at the school and district level for optimum student academic performance.

New Jersey does not include in the accountability system the results of any student enrolled less than one full academic year in a school for school accountability, or in a district for district accountability. This does not exclude from a district's accountability the results of those students who transfer from one school to another within a district.

3.2 Test Security Procedures

The NJ ASK test booklets and its contents were treated as secure materials. Detailed procedures for maintaining the security of test materials while they were in the districts were outlined in the *New Jersey Assessment of Skills & Knowledge Spring 2008 Test Coordinator Manual Grades 5–8*. It was the responsibility of the district to guarantee the security of the test materials. Examiners, proctors, and other school personnel were prohibited from copying, reading, discussing, or disclosing any test items before, during, or after test administration. When not being used during a test period, test materials were stored in a secure, locked location that was accessible only to individuals whose access was authorized by the school test coordinator. Inventory forms tracked test materials as they moved from one location to another in districts.

As part of the test development procedures, "breach" test forms and examiner manuals were prepared in the event of a security breach. If the NJ DOE identified a security breach during the test administration window, MI immediately removed the NJ ASK test materials from the involved district or school. The test booklets for the content area affected were coded with a void code indicating a security breach. If the NJ DOE determined that there was enough time for testing, the breach forms were delivered to the district and the test was administered to the

affected students in the content area impacted by the security breach. For students re-tested during the test administration window, scores were reported based on the breach form. If a security breach was identified after the testing window, the impacted test booklets were coded with a security breach void code and no test results were reported for that content area. However, students received a score for the content area not impacted by the security breach.

3.3 Test Administration Procedures

Detailed instructions for administering the NJ ASK were provided in the *New Jersey Assessment of Skills & Knowledge Spring 2008 Test Coordinator Manual Grades 5–8.* The NJ ASK 5–8 was administered according to the following schedule:

	Test Dates		**Testing[1] Time (minutes)**				
			LAL		Math		Science
	Regular testing	Make-up testing	Day 1	Day 2	Day 3	Day 4	Day 4
Grade 5	5/5/08-5/8/08	5/12/08-5/15/08	115	140	51	69	N/A
Grade 6	5/5/08-5/8/08	5/12/08-5/15/08	115	140	51	69	N/A
Grade 7	4/28/08-5/1/08	5/5/08-5/8/08	115	140	55	69	N/A
Grade 8	4/28/08-5/1/08	5/5/08-5/8/08	115	140	133	N/A	120

Testing was not to be scheduled immediately after an athletic event or an assembly. All test schedules were checked with the appropriate school officials to ensure that other school activities did not interfere with the test administration. Other test administration procedures included:

- All testing had to be scheduled in the morning. Exceptions included homebound and bedside students, as well as students attending out-of-district placements who were tested at that placement by staff from the student's home district.
- The district and school test coordinators (DTCs/STCs) were responsible for scheduling times and places for regular and make-up testing and for ensuring that all testing was completed according to the procedures and schedule described in the *Test Coordinator Manual* and in the *Examiner Manual*.
- Students who were required to test but were absent for the regular test administration had to be tested on the make-up dates.
- Students whose answer folders were voided during testing were considered to have attempted the test section. They were not allowed to retake or resume taking the voided test section during the make-up.
- Students who began a section of the test and did not complete it during the specified testing time were not allowed to complete the test section during the make-up period or any other time unless additional time was specified in their IEP or 504 plan.

[1] Does not include administrative time

3.4 Test Accommodations

To ensure that students are tested under appropriate conditions, the Department of Education has adopted test accommodations and modifications that may be used when testing special populations of students. The content of the test typically remains the same, but administration procedures, setting, and answer modes may be adapted. Students requiring accommodations must be tested in a separate location from general education students.

General education students receive no special testing accommodations other than the standard room setup and materials distribution described in the examiner's section of the Test Manual.

Limited English Proficient (LEP) students are tested with one or more of these accommodations:

- Additional time up to 150% of the administration times indicated
- Translation of directions only to the student's native language.
- Translations of passages, items, prompts, and tasks are NOT permitted
- Use of a bilingual dictionary, preferably one normally used by the student as part of the instructional program.

Students with Disabilities (SE/504) must take the NJ ASK unless their Individualized Education Program (IEP) specifically states that they take the Alternate Proficiency Assessment (APA) and not the NJ ASK.

Students who are eligible under Section 504 of the Rehabilitation Act of 1973 may be tested using modified testing procedures that must be specified in the student's 504 accommodation plan.

Visually impaired students may take either a Braille or large-print version of the test. Specific instructions for administering the Braille and large-print versions of the test are provided in the supplementary instructions for examiners administering these forms.

Students using the Braille test booklets:

- are instructed to bring a Braille ruler and a talking calculator to the test session.
- are instructed to skip some items identified in the Braille instructions. The spaces for these items must be left blank on the student answer folder.
- have answer folders transcribed from Braille version by the examiner.
- dictate their answers to the examiner or use a device that produces Braille.
  For dictations and responses recorded in Braille:
    - students must indicate all punctuation and must spell all key words.
    - examiners must transcribe the Brailled responses into the regular answer folder.

Students using the large-print test booklets:

- mark their answers in the large-print answer folders.
- may be instructed to skip some questions.
  The spaces for these questions must be left blank in the student's large-print answer folder.
- who dictate responses on constructed-response items and writing tasks indicate all punctuation and spell key words.

Accommodations and modifications of test administration procedures are listed in Appendix B of this report. Also, the accommodations and modifications are included in the Test Coordinator Manual**.**

If a student requires an accommodation or modification that is not listed, district staff are instructed to contact the Office of State Assessments, NJ ASK Coordinator. Accommodations or modifications are classified as follows:

A= Setting Accommodations
B= Scheduling Accommodations
C= Test Materials/Modifications
D=Test Procedures Modifications

Tables 3.4.1 – 3.4.9 provide disaggregations of special education and Section 504 students by the specific accommodation or modification required. Not every Section 504 student is tested with an accommodation or modification. Accommodations and modifications may be used separately or in combination. These tables show the type of accommodation, the number of special education and Section 504 students tested, along with their mean performance results.

Table 3.4.1: Descriptive Statistics for Grade 5 LAL Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	14867	180.56	24.81	100	294	76.89	22.8	0.32
B	14971	180.52	24.77	100	294	76.94	22.76	0.31
C	572	178.23	26.80	110	254	77.45	22.38	0.17
D	14269	180.03	24.60	100	294	77.74	22.01	0.25

Table 3.4.2: Descriptive Statistics for Grade 6 LAL Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	15398	178.05	24.41	100	275	80.74	19.09	0.16
B	15505	178.10	24.42	100	275	80.56	19.28	0.16
C	538	177.23	28.78	100	252	76.21	23.61	0.19
D	14685	177.48	24.13	100	271	81.67	18.22	0.11

Table 3.4.3: Descriptive Statistics for Grade 7 LAL Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	16246	185.90	28.55	100	300	67.98	30.41	1.61
B	16286	186.07	28.58	100	300	67.80	30.55	1.65
C	598	187.77	31.21	100	300	62.54	34.78	2.68
D	15167	185.11	28.24	100	300	69.18	29.33	1.48

Table 3.4.4: Descriptive Statistics for Grade 8 LAL Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	16208	196.42	24.10	100	300	53.29	45.43	1.27
B	16119	196.58	24.20	100	300	52.99	45.67	1.33
C	773	199.82	24.72	115	276	47.99	49.55	2.46
D	14737	195.63	23.85	100	300	54.62	44.34	1.04

Table 3.4.5: Descriptive Statistics for Grade 5 Mathematics Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	14893	198.00	35.54	100	300	51.90	39.68	8.42
B	14995	197.93	35.49	100	300	51.96	39.65	8.38
C	575	195.23	38.06	100	300	55.13	35.30	9.57
D	14294	197.44	35.31	100	300	52.46	39.56	7.98

Table 3.4.6: Descriptive Statistics for Grade 6 Mathematics Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	15440	190.72	32.07	100	300	61.96	33.47	4.57
B	15546	190.73	32.03	100	300	61.99	33.47	4.53
C	536	194.71	36.96	100	300	55.04	37.87	7.09
D	14725	189.91	31.61	100	300	62.95	32.91	4.14

Table 3.4.7: Descriptive Statistics for Grade 7 Mathematics Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	15503	179.02	35.28	100	300	72.61	23.71	3.68
B	15547	179.08	35.24	100	300	72.53	23.75	3.71
C	591	183.06	39.63	100	300	68.36	25.72	5.92
D	14432	178.15	34.83	100	300	73.68	22.96	3.36

Table 3.4.8: Descriptive Statistics for Grade 8 Mathematics Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	15845	178.28	40.45	100	300	70.29	24.18	5.53
B	15879	178.41	40.39	100	300	70.12	24.40	5.48
C	645	182.16	43.50	100	300	66.51	25.74	7.75
D	14378	176.93	39.70	100	300	71.61	23.51	4.88

Table 3.4.9: Descriptive Statistics for Grade 8 Science Scale Scores and Percentage Distributions of Special Education and Section 504 Students' Performance Levels by Accommodation Type – 2008 NJ ASK Operational Forms

Accommodation	N	Mean	STD	Min	Max	%PP	%P	%AP
A	15980	208.09	28.85	100	300	40.36	50.41	9.22
B	15947	208.24	28.87	100	300	40.10	50.66	9.25
C	705	212.48	30.72	129	300	34.89	52.77	12.34
D	14509	207.07	28.27	100	300	41.31	50.31	8.38

PART 4: QUALITY CONTROL PROCEDURES

4.1 Quality Control for Test Construction

Jointly, MI and the NJ DOE ensure that the content and editorial quality of the test booklets meet or exceed the state's expectations for NJ ASK. This requires consistent vigilance and quality control checks during the test booklet assembly process. The test booklet assembly process includes the following steps:

- operational tests are assembled from the approved NJ ASK test designed using field-tested items that are proven valid and fair to all students;
- test booklets are assembled using approved general and NJ ASK style guidelines;
- typeset test booklets are proofread by two editorial staff members for typographical and format errors, as well as, to determine whether the version of the item used is consistent with the field-tested version;
- test booklets are sent to NJ DOE for a typeset review;
- MI makes NJ DOE requested revisions repeating the process until NJ DOE approves the test booklet;
- upon NJ DOE approval, the operational test booklet is sent to a proofreading agency external to MI for an independent review;
- the final approved version of the test booklet is then converted to a Portable Document Format (pdf) electronic file for printing;
- the pdf version of the test booklet is proofread by editorial staff before submitting to the printing manager.
- MI project management staff reviews the first copies of the production run of the test booklets for possible problems.

Ancillary test materials are subject to the same consistent vigilance and quality control. The following procedures apply to all ancillary test materials:

- typeset copies are proofread by at least two editorial staff members
- typeset copies are then submitted to NJ DOE for a typeset review
- NJ DOE must approve materials prior to printing
- approved versions of the ancillary materials are converted to pdf files for printing.

All accommodated materials are also subject to consistent vigilance and quality control at all stages.

- The large print test and supporting materials are subject to the same assembly quality control discussed previously.
- The Braille translation of the test and supporting materials is performed by an independent, certified translation agency.
- The large print and Braille versions of the test materials are then submitted to NJ DOE for review by specialists from the state commission for the blind.
- Revisions to the materials are made based on recommendations from these state specialists, and then the accommodated materials are sent to production.

- The Spanish translation of the test and supporting materials is performed by Second Language Testing, Inc.

4.2 Quality Control in Data Preparation

In order to ensure the quality of the testing materials, MI and the NJ DOE work together to rigorously proof all materials prior to printing/production. The following steps are included in the quality control procedures:

- Items have undergone multiple reviews to ensure that operational and field test items are valid and fair for all students.
- All assessment materials are submitted to rigorous editing and proofreading procedures.
- The MI editorial staff first checks all copy for materials to be developed prior to being typeset to assure continuity exists across all documents.
- Prior to typesetting of any documents, sample layouts based on the approved NJ ASK Style Guide are provided to NJ DOE staff for review and approval.
- Typeset page proofs are then prepared and thoroughly proofread.
- Well-trained staff members read the documents in their entirety for typographical errors and potential problems in context.
- Copies of the page proofs are provided to the NJ DOE for review and approval.
- Upon approval of the page proofs, blueline (or printer's) proofs are produced.
- Two staff members and two independent editors proofread the blueline proofs of all documents and then provided them to the NJ DOE for final approval prior to printing.
- NJ DOE approves all forms necessary for test administration prior to final production.

Additionally, all accommodated materials are reviewed for accuracy and quality at multiple stages.

- The first stage of review involves content specialist ensuring that the items used on the tests are still valid in the accommodated format.
- Once this is completed, the large print test follows the quality control procedures discussed previously, while the other formats undergo **additional** quality control procedures.
- The Braille test is reviewed by an independent contractor that double-checks the integrity of the translation from print to Braille.
- The Spanish test is reviewed by an independent contractor that double-checks the integrity of the translation from English to Spanish

4.3 Quality Control in Scanning

Scanning and scoring programs were fully tested and reviewed using structured testing methodologies before live test materials were processed, and were continually monitored throughout the process. MI's Quality Assurance (QA) staff developed independent queries to validate all software programs and programmatically produced deliverables for reporting. Each program was tested to ensure that data were included or excluded as appropriate, with particular attention to any special equating situations, and programmatic calculations were

performed accurately and according to the reporting rules provided by the New Jersey client. During the QA process, reader score sheets were reviewed and compared to student records to verify that scores were applied appropriately. A selection of students was presented to ensure coverage of each type of demographic coding scenario as well as any overrides that were done by MI according to coding rules developed in conjunction with the New Jersey client.

MI monitored all aspects of machine scanning. Ensuring the accuracy of demographic data collection was an important component of producing accurate student score reports. Therefore, MI created a detailed data verification plan according to our usual high standards for data capture. This plan encompassed all phases and was a comprehensive set of quality processes to ensure the utmost accuracy of the final reports and file deliverables.

QA staff conducted rigorous tests prior to the scanning of live answer documents to collect student demographic data. Scanning applications that included every scanable document were written using Pearson's ScanTools Plus® application. Each application was tested to ensure it was properly defined and set up. This testing stage was conducted to ensure that the data derived from all grids appearing on the scanable document were included in the export file, were accurately read, and returned the correct value. A quality control sample of answer document demographics (test deck) was created so that all possible responses were verified. This structured method of testing provided exact test parameters and a methodical way of determining that the output received from the scanner(s) was correct. The documents and the data file created from them were carefully compared to further ensure that results from the scanner were accurate. Accurate scanner calibration was verified at the time of testing, and scanners were re-calibrated to specifications prior to each staff shift change to ensure that calibration remained constant and accurate.

MI has developed a set of comprehensive guidelines for eliminating situations that might threaten the integrity of scanned data. By following these strict guidelines, our scanner operators ensured that the most accurate information possible was read from the document. Scanner operators handled minor response document repairs that allowed the original documents to go through the scanner properly. Small rips in a page were often repaired using cellophane tape, for example. In the rare event that a page from an answer document had more serious damage, the gridded responses from the original, damaged page were transcribed onto a replacement page. A second person verified that the page was transcribed correctly. An adhesive label was placed on the original page explaining that it was transcribed, who transcribed it, and the litho code value (answer folder number) of the page it was transcribed onto. This page was kept with the rest of the document as a reference in case of a question or challenge.

Besides handling student document pages that do not scan, scanner operators also responded to extra pages rejected by the scanner. When an extra page contained a handwritten or typewritten response, the scanner operator filled out a label identifying the document it was associated with and attached that label to the page. The scan bin was set aside, and a scoring assistant was notified. The scoring assistant determined whether the page contained responses that should be used in determining the student's score. If it did, the item with which the extra page was associated was indicated on the label. This extra page was kept with the

corresponding original response document page throughout processing so that scoring staff would assign the correct score to the student.

4.4 Quality Control in Editing and Data Input

MI used a successive check of quality assurance and control system to ensure and maintain accurate and timely scoring results, reporting, and dissemination of data. Throughout the execution of the software testing, all defects were logged, assigned, and followed through to resolution. Software changes or "fixes" provided by the developer to resolve defects were re-tested until satisfactory results were achieved. Regression testing of previously tested functionality was performed to ensure that the fix did not adversely affect any other functionality of the application/system.

Deployment of software applications to the staging environment was also tested during the QA process in partnership with MI's Network Operations (NetOps) team. The staging environment closely matched the production environment, which enabled us to determine projected behavior once the application was deployed to the production environment.

4.5 Quality Control in Scoring

MI constantly monitors the quality of each scorer's work throughout every project. Methods used to monitor scorers' scoring habits in scoring NJ ASK included the use of Daily Reader Status Reports.

For writing and constructed-response items, each student writing sample was scored holistically by readers using the Registered Holistic Scoring Method. A different reader from another team read identified packets a second time. Readers had no knowledge of previously recorded scores. After the scores from each day's work were entered, MI's data application calculated the results and generated a status report. These reports showed the total number of papers read and the percentage agreement of each reader, both perfect and adjacent, for the second-read packets. The reports also showed score point distributions. Scoring directors examined the reports and used the information to determine the need for retraining of individual readers or the group as a whole. It could easily be determined if a reader was consistently scoring "too high" or "too low," as well as the specific score points with which they may have been having difficulty. The Daily Reader Status Reports showed not only the current daily totals for each scorer, but also the project-to-date totals.

Retraining was an ongoing process once scoring began. Daily monitoring of completed packets and analysis of agreement rates provided by the Daily Reader Status Reports and validity packets alerted team leaders and management personnel to individual retraining needs. If it became apparent that a whole team or a whole group was having difficulty with a particular type of response, large group training sessions were conducted. Standard retraining procedures included room-wide discussions led by the scoring director, team discussions conducted by team leaders, spot-checking of individual scorers by team leaders, and discussions between team leaders and individual scorers.

Scorers were dismissed when, in the opinion of the scoring director and the project director, they had been counseled, retrained, and given every reasonable opportunity to improve but were still performing below the acceptable standard.

4.6 Quality Control in Reporting

MI fully recognizes the importance of problem-free score reporting and has employed stringent quality control procedures ensuring that reporting on all levels was complete and accurate to the extent possible for the NJ ASK 5–8 assessment. With this in mind, MI thoroughly tested, reviewed, and proofread all reporting deliverables prior to delivery to the New Jersey client.

QA staff verified the content of preliminary reports during the preliminary reporting phase and ensured that reports contained the correct information presented in a clear, concise manner. Reports were tested to ensure that valid values were verified, valid codes were included on student records, correct scores were reflected and were attributed to the correct student, cluster scores were accurately aggregated and totaled, and appropriate student totals were reported in all aggregate reports.

QA also verified formatting of reports, including fonts, footnotes, line separations, sections, and headings. This testing process was included in all aspects of data files, electronic reports, and printed reports. During the printing of the final reports, QA verified that print quality was excellent and all reports for all students, schools, and school systems were complete.

PART 5: SCORING

5.1 Multiple-Choice Items

The answer keys approved by NJ DOE are used to score the multiple-choice items after the responses have been scanned. Each item has a key associated with the item (A, B, C, or D), which has been supplied and verified by the NJ ASK content specialists. All correct answers are assigned the value of "1" while incorrect answers are assigned the value of "0." At no time in this process is the original scanned answer overwritten, in case the key is determined to be incorrect during the post-scoring quality assurance check. After scoring is completed, simple item statistics are provided to the appropriate NJ ASK content specialist to ensure that the correct keys are being applied. If a key changes, then the process is repeated until the scoring file is correct. The key-check data file contains the following information:

- percent of students getting the question correct (PC);
- correlation of the item to the test as a whole (Rpb);
- correlation of each possible response option to the test as a whole (RpbA, RpbB, etc.);
- percentage of students choosing each response option (A, B, C, D or X-omits); and
- flags for items with high difficulty (DFLAG) or low correlations (CFLAG).

5.2 Constructed-Response Items

Scorer Selection

Because MI has been conducting the handscoring of writing and open-ended items for many years, MI already has available a large pool of qualified, experienced readers. MI needs only to inform them that a project is pending and invite them to return. MI routinely maintains supervisors' evaluations and performance data for each person who works on each scoring project in order to determine employment eligibility for future projects. MI employs many experienced readers for this project and recruits new ones as well.

MI procedures for selecting new readers are very thorough. After advertising in local newspapers, with the job service, and elsewhere, and receiving applications, staff in the human resources department review the applications and schedule interviews for qualified applicants. Qualified applicants are those with a four-year college degree in English, language arts, education, mathematics, science, or a related field. Each qualified applicant must pass an interview by experienced MI staff, write an acceptable essay, and receive good recommendations from references. All information about each applicant is reviewed before offering employment.

In selecting team leaders, MI's management staff and scoring directors review the files of all the returning staff. They look for people who are experienced team leaders with a record of good performance on previous projects and also consider readers who have been recommended for promotion to the team leader position.

MI is an equal opportunity employer that actively recruits minority staff. Historically, our temporary staff on major projects averages about 70% female, 30% male, 76% Caucasian and 24% minority. MI strongly opposes illegal discrimination against any employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, sex, age, handicap, national origin, ancestry, veteran status, or sexual orientation.

Range Finding

Range finding meetings are conducted to establish "true" scores for a representative sample of papers. Between 100 and 220 sample papers per task are chosen by MI leadership personnel either from the available field test papers or from the current test administration. For items using specific rubrics, the rubrics are discussed and refined. The sample responses brought to the range finding meetings are selected from a broad range of New Jersey school districts in order to ensure that the sample is representative of overall student performance. The range finding committees consist of NJ DOE content specialists, NJ teacher representatives, MI management personnel, as well as the scoring director responsible for each content.

Field Test Range Finding

Prior to field test scoring, content committees consisting of NJ DOE personnel, NJ teacher representatives, and MI leadership personnel meet in New Jersey to determine "true" scores for 30 selected papers representing each of the score points for each item to be tested. Field test scoring guides and training sets are developed using the papers scored at the range finding.

Developing Scoring Guides

After the range finding meeting, MI management and the scoring directors develop training materials consisting of an anchor set (examples of responses for each score point) and training/qualifying sets (practice papers) for each task using the responses scored at range finding. Anchor sets usually consist of three, or more, annotated examples of each score point in score point order. Training/qualifying sets consist of clearly anchored papers in random score point order. Please see scoring rubrics in Appendix C.

Team Leader Training and Qualifying

After the anchor papers, training, and qualifying papers have been identified and finalized, team leader training is conducted by the scoring director for each task, a process which typically takes up to four days depending on the content. Procedures are similar to those for training scorers but are more comprehensive, dealing with resolution of discrepant scores, identification of non-scorable responses, unusual prompt treatment, alert situation responses (e.g., child-in-danger), and other duties performed only by team leaders. Team leaders take careful notes on the training papers in preparation for discussion with the scorers, and the scoring directors counsel team leaders on application of the rubric and training techniques.

Effective scorer training relies to a great extent on having knowledgeable, flexible team leaders. Team leaders assist in training scorers in discussions of training sets, and are responsible for distributing, collecting, and accounting for training packets and sample papers during each scoring session. During scoring, team leaders respond to questions, spot-check scorer packets, and counsel scorers having difficulty with the criteria.

Team leaders also administer the quality control validity sets, monitor the scoring patterns of each scorer throughout the project, conduct retraining as necessary, perform some resolution readings, and maintain a professional working environment. Team leaders work 7.75 hours per day, excluding breaks.

Scorer Training/Qualifying

All scorers are trained using the rubrics, anchor papers, training papers, and qualifying papers selected during the range finding meetings and approved by the NJ DOE. Scorers are assigned to a scoring group consisting of one team leader and 10-12 scorers. Each scorer is assigned an individual number for easy identification of his or her scoring work throughout the scoring session.

After the contracts and nondisclosure forms are signed, training begins. Scorer training follows the same format as team leader training. The scoring director introduces the set of anchor papers and thoroughly discusses each score point. This presentation is followed by practice scoring on the training sets. Scorers break into teams to discuss the papers in the training sets. This arrangement gives scorers an opportunity to discuss any possible points of confusion or problems in understanding the criteria in a small group setting.

Team leaders collect the monitor sheets after the scoring of each training set, and record results on a customized log which is examined by the scoring director to determine which papers are giving scorers difficulty. The scoring director also "floats" from team to team, listening to the team leaders' explanations and adding additional information when necessary. If a particular paper or type of paper seems to be causing difficulty across teams, the problem is discussed with the room at large to ensure that everyone hears the same explanation.

Scorers must demonstrate their ability to score accurately by attaining 90% adjacent agreement (within one point) percentage on the qualifying sets before they read packets of actual papers. Any reader unable to meet the standards set by the NJ DOE will be dismissed. All scorers understand this stipulation when they are hired.

Training is carefully orchestrated so that scorers understand how to apply the rubric in scoring the papers, learn how to reference the scoring guide, develop the flexibility needed to deal with a variety of responses, and retain the consistency needed to score all papers accurately. In addition to completing all of the initial training and qualifying, a significant amount of time is allotted for demonstrations of paper flow, explanations of "alerts" and "flagging," and instructions about other procedures which are necessary for the conduct of a smooth project. Scorers generally work 7.0 hours per day, excluding breaks.

Levels of staffing for scoring of the 2008 NJ ASK are listed in Table 5.2.1. The table shows the numbers of scorers, team leaders and scoring directors at each grade level who participated in scoring.

Table 5.2.1: Scoring Personnel by Grade and Content Area - 2008 NJ ASK

Content Area	Grade	Scorers	Team Leaders	Scoring Directors
LAL				
	5	262	26	6
	6	228	27	6
	7	220	27	7
	8	270	32	6
Math				
	5	75	4	4
	6	76	5	5
	7	99	9	4
	8	75	6	5
Science				
	8	48	5	3
Spanish				
	5	11		
	6	18		
	7	21		
	8	12		

As part of the scoring process, rescoring is conducted automatically for any student who scores within two raw score points of the proficient cut score. MI reviews writing and constructed-response items and verifies the original scores or makes changes, if warranted. Scores are never lowered during the automatic rescoring process even if a lower score resulted. Districts do not need to request rescore.

Monitoring Scorer Performance

MI constantly monitors the quality of each scorer's work throughout every project. Methods used to monitor scorers' scoring habits in this project include the use of Daily Reader Status Reports.

Each student writing sample will be scored holistically by two independent readers using the Registered Holistic Scoring Method. The two independent scores, if identical or adjacent, will be combined to produce the student's final score on each task. If the two scores differ by

more than one score point, the response will be scored by a third reader. The final score is determined by an algorithm supplied by the NJ DOE.

After the scores from each day's work are entered, our data application calculates the results and generates a status report. These reports show the total number of papers read, the number of third readings required, and the percentage agreement of each reader, both perfect and adjacent. The reports also show score point distributions. Scoring directors are experienced in examining the reports and using the information to determine the need for retraining of individual readers or the group as a whole. It can easily be determined if a reader is consistently scoring "too high" or "too low," as well as the specific score points with which they may be having difficulty. The Daily Reader Status Reports show not only the current daily totals for each scorer, but also the project-to-date totals.

Retraining is an ongoing process once scoring begins. Daily monitoring of completed packets and analysis of agreement rates provided by the Daily Reader Status Reports and validity packets alert team leaders and management personnel to individual retraining needs. If it becomes apparent that a whole team or a whole group is having difficulty with a particular type of response, large group training sessions are conducted. Standard retraining procedures include room-wide discussions led by the scoring director, team discussions conducted by team leaders, spot-checking of individual scorers by team leaders, and discussions between team leaders and individual scorers.

Scorers are dismissed when, in the opinion of the scoring director and the project director, they have been counseled, retrained, and given every reasonable opportunity to improve and are still performing below the acceptable standard.

PART 6: STANDARD SETTING

6.1 Overview of the Process

Standard setting is typically conducted shortly after the initial administration of an operational test (i.e., in the base year). For NJ ASK, standard setting is used to establish two raw score cuts that distinguish performance among three levels: Partially Proficient, Proficient, and Advanced Proficient. Equating procedures utilizing item response theory (IRT) are used to ensure that future test forms are equivalent to the base year test. See Part 8, Scaling and Equating, for more information about equating procedures.

After the first administration of the new NJ ASK 5-8 in April-May 2008, standard setting was conducted for each grade in order to determine the cut scores for LAL and mathematics. Standard setting was not conducted for science as the eighth grade science assessment was based on the same test design as the 2007 GEPA science assessment. GEPA science cut scores were set in 2000.

The NJ ASK grades 5–8 standard setting was held June 24 through June 27, 2008. The meeting involved 86 educator-panelists* from around the state who recommended performance standards on the following tests:

- Language Arts Literacy (LAL), Grades 5-8
- Mathematics, Grades 5-8
- Spanish Language Arts Literacy, Grades 5-8

*See Appendix D-1 for a list of participants.

On June 30, the Commissioner and senior staff of the NJ DOE met to review the recommendations of the panelists. Minor adjustments were made to the recommended cut scores. The cut scores for the Spanish-language versions of the Language Arts tests were set aside. The decision rested largely on the fact that the committees making the recommendations consisted of only four panelists each. The Commissioner's recommendations were submitted at the New Jersey state board meeting and were adopted on July 16, 2008.

The full Standard Setting report, available from the New Jersey Department of Education (NJ DOE), provides details about the standard setting procedures, demographic information of the panelists, panelists' ratings from one round to the next, and their responses on the evaluation forms. The final cut scores approved by the State Board of Education are also presented. The sections below summarize the most important steps of the standard setting process. For more detail, the full Standard Setting Report should be referenced.

6.2 Procedures

Development of Performance Level Descriptors (PLDs)

NJ DOE staff, working with staff from MI, developed draft performance level descriptors (PLDs). These are statements describing what students at the Partially Proficient, Proficient, and Advanced Proficient levels know and can do. The PLDs are stated in terms of the state content standards for LAL and mathematics (the Core Curriculum Content Standards, or CCCS). NJ DOE staff placed the draft PLDs on the state website for NJ educators' comment during January-March 2008 and made further refinements. On May 30, 2008, NJ DOE staff, together with MI staff, presented the revised PLDs to committees of New Jersey educators meeting in Princeton for further review and revision. At this one-day meeting, participants made numerous suggestions for revisions which were collated by NJ DOE staff to integrate into final PLDs. These final PLDs were edited, reviewed, and made ready for use at the June 24-27 standard-setting meeting. The PLDs for the Spanish-language versions of the LAL tests were translated by Second Language Testing, Incorporated. These translated PLDs were then reviewed by NJ DOE staff and approved for use in the standard setting meeting. The final PLDs for LAL, mathematics, and science are attached as Appendix D-2.

Standard Setting Process

The 2008 grades 5–8 standard setting included student data based on a sample of data from priority districts that consisted of more than 30% of the student population. As stated previously, the priority districts are a small sample of districts representing the statewide DFG and ethnic composition. As standard setting must occur shortly after the first administration of a new test, a sample of student work must be scored expeditiously for use in establishing new cut scores. The scores for 143,184 students from grades 5, 6, 7, and 8 were used in setting the LAL standards and a total of 155,548 students were used in setting the mathematics standards. In addition, the scores for 2,490 students were used in setting the standards for the Spanish version of LAL.

For previous standard-setting activities, NJ DOE has employed a combination of modified Angoff and Body of Work procedures (Cizek & Bunch, 2007). For this activity, MI recommended a Bookmark procedure, and NJ DOE accepted the recommendation.

The Bookmark procedure was developed specifically for mixed-format tests. The overall format of the NJ ASK tests is predominantly multiple-choice (MC) with a significant number of short constructed-response (SCR) items and extended-constructed-response (ECR) items. SCR items are mathematics items that can be answered with a brief response that is scored correct or incorrect (1/0). ECR items are 3- or 4-point brief essay items in both LAL and mathematics. The LAL tests also include two writing prompts scored on a 6-point scale, with the exception being Grade 5 which uses a 5-point scale.

With the Bookmark procedure, panelists examine test items in a difficulty-ordered booklet and determine whether or not a minimally Proficient or minimally Advanced Proficient

student would have a 2/3 chance of answering the item correctly (for MC items) or obtain the given score point (for CR items). The difficulty-ordered booklet consists of the items from the actual test but arranged in order of difficulty, with the easiest item on the first page and the most difficult item on the last page. MC and SCR items appear only once in the booklet, but ECR items and writing prompts appear once for each score point. An item worth three points would appear three times, the first time with a sample response representing one point, later with a sample response representing two points, and so on. Each page contains essential information about the item, including its position in the ordered booklet, its position in the original booklet, and the achievement level (theta) required for a student to have a 2/3 chance of answering correctly or obtaining that point. These theta values are derived from analysis of the student responses to the items through the use of item response theory (IRT) procedures. Specifically, for NJ ASK, MI uses the Rasch model for item calibration and test construction. This model allows for the calibration of all items and students on a common scale. This common calibration allows for the calculation of a probability of a correct response to a given item by a given student from information about the student's achievement level (θ) and the items difficulty level (δ).

Panelists enter two bookmarks on a special form, one each for the last page they believe a minimally Proficient or minimally Advanced Proficient student would have a 2/3 chance of answering correctly. The page number is associated with a theta required for a 2/3 chance of answering correctly. These theta values are averaged across all panelists. The mean theta is then translated into a score via a table from the Rasch (in this case) analysis of the live test results. The tabled raw score closest to this value becomes the cut score. In practice, panelists usually engage in three rounds of rating in this manner, with feedback between rounds. Typically, normative feedback is provided between Rounds 1 and 2 so that panelists can compare their judgments to those of other panelists. Between Rounds 2 and 3 impact data are usually supplied.

6.3 Summary of Results

Panelists, working in two-grade groups considered each test in three rounds. During Round 1, each panelist placed two bookmarks, one for Proficient and one for Advanced Proficient. MI staff analyzed the data for Round 1 and led discussions of the results. Panelists then repeated the process of placing bookmarks in Round 2. After Round 2, MI staff again analyzed the data and presented results to the panelists, along with score distributions showing percentages of students who would be classified as Partially Proficient, Proficient, and Advanced Proficient on the basis of the Round 2 cut scores. After discussion of these results, panelists once again placed two bookmarks in Round 3. These bookmarks defined the final cut scores (averaged over all panelists in a given group) to be forwarded to the NJ DOE.

On June 30, the Commissioner and senior staff met to review the recommendations of the panelists. This group focused on the range of cut scores across grades and the resulting percentages of students classified at Proficient or above. As a result of their review and discussions, this group reset some of the cut scores for language arts literacy and mathematics recommended by the New Jersey educators who had met the previous week. In all but two instances, the changes were within one standard deviation of the original cut scores recommended by the panelists.

The commissioner's advisory group also decided to set aside the cut scores for the Spanish-language versions of the Language Arts tests. The decision rested largely on the fact that the committees making the recommendations consisted of only four panelists each, too small a number to yield reliable consensus. The advisory group could not find a consistent pattern either to the cut scores or percentages of students rated Proficient or above. Therefore, the group decided to use the cut scores set for the English-language versions of the LAL tests on an interim basis and reset cut scores for the Spanish-language versions in 2009 when grades 3 and 4 are included in the new NJ ASK.

Final recommended performance standards are reported in Table 6.3.1. The table includes the total number of points possible on each test. The Proficient Cut Score Mean includes both the raw score mean and the mean expressed in terms of a percentage of the Total Points Possible. This latter figure is shown in parentheses in the Proficient Cut Score Mean column. The final column in Table 6.3.1 shows the total number of points possible for each test.

Please note new standards for grade 8 science **were not** established during the 2008 standard setting meeting, as the item types and timing of the science test has not changed. Science standards were set in 2000 resulting in a proficient cut score of 22 and an advanced proficient cut score of 39.5. Equating was used in order to maintain the same scale in 2008 as was used in 2000. The resulting equated cut scores are 20 for proficient and 38 for advanced proficient.

Table 6.3.1: 2008 Approved Cut Scores*

	Proficient Cut Score		**Advanced Proficient Cut Score**		**Total Points Possible**
	Raw Score	% Correct	Raw Score	% Correct	
LAL 5	40.0	53	57.5	77	75
LAL 6	41.5	53	59.0	76	78
LAL 7	39.0	50	55.0	71	78
LAL 8	42.5	54	60.0	77	78
Math 5	25	50	40	80	50
Math 6	25	50	41	82	50
Math 7	27	52	42	81	52
Math 8	29	56	43	83	52
Spanish LAL 5	40.0	53	57.5	77	75
Spanish LAL 6	41.5	53	59.0	76	78
Spanish LAL 7	39.0	50	55.0	71	78
Spanish LAL 8	42.5	54	60.0	77	78

*Cut scores were approved by the New Jersey State Board of Education on July 16, 2008.

The adopted Proficient cut scores were at or above 50 percent of the total possible raw score points possible for all tests. Cut scores on previous versions of these tests (which were

developed under different specifications) were nearly always lower than 50 percent of total possible points (eighth grade being the exception).

The impact of these cut scores on New Jersey students is summarized in Table 6.3.2. The final column of the table shows the total percentage of students whose scores would place them in the Proficient or Advanced Proficient category. The number of students upon which these percentages are based is only a representative sample of the entire population. Thus, a slightly different outcome may result when all of the data are analyzed. For the Spanish-language version of the LAL tests, all students tested were included.

Table 6.3.2: Percentages of Students Classified at Each Level Compared with 2007 Results

Test	Number Tested	Partially Proficient	Proficient	Advanced Proficient	Proficient or Above	% Correct for Proficient. in 2007	Proficient or Above in 2007
LAL 5	35,472	39.5	55.5	5.0	60.5	39	88.8
LAL 6	34,080	45.8	51.4	2.8	54.2	42	75.8
LAL 7	35,093	30.5	55.6	13.9	69.5	44	80.1
LAL 8	38,539	19.0	67.7	13.3	81.0	55	73.6
Math 5	34,205	23.2	48.6	28.2	76.8	46	84.2
Math 6	31,732	26.2	52.7	21.1	73.8	44	79.0
Math 7	44,060	34.3	45.4	20.3	65.7	33	66.3
Math 8	45,551	32.2	42.8	25.0	67.8	50	68.4
Spanish Version of LAL							
LAL 5	500	88.0	12.0	0.0	12.0	No Test	No Test
LAL 6	655	92.1	7.9	0.0	7.9	No Test	No Test
LAL 7	670	82.8	17.2	0.0	17.2	No Test	No Test
LAL 8	665	69.8	30.2	0.0	30.2	No Test	No Test

It is noteworthy that the eighth grade LAL test results place far more students in the Proficient or Advanced Proficient category than is the case for Language Arts tests in grades 5-7. This discrepancy may be due to the fact that the eighth grade test has been in place for a decade, while the others have been in place for only a couple of years. While all tests were modified in 2008, relative to 2007, to reflect new standards, the change was less severe for grade 8 because New Jersey educators and MI have been anticipating these changes for many years.

The last column of Table 6.3.2 shows the percentages of students in the Proficient or Advanced Proficient categories in 2007. These figures are included for comparison. In general, the percentages of students scoring in the Proficient or Advanced Proficient categories in 2008 were lower than in 2007. Again, the exception is grade 8, where the percentages of students in these categories actually rose by 6.4 percent. In Mathematics,

performance in 2008 was very close to that of 2007 for grades 7 and 8 and down 5-7 percent for grades 5 and 6.

Table 6.3.3 shows the contrast between results of the 2008 test administration and the 2007 administration. This table shows the percentages of total possible points required to be classified as Proficient or above for both years, along with the percentages of students so classified, overall and by subgroup.

Table 6.3.3: Percentage of Students - Proficient or Above by Grade, Subject, and Subgroup 2008 vs. 2007*

		Grade							
		5		6		7		8	
		LAL	Math	LAL	Math	LAL	Math	LAL	Math
All Students	**2008**	**61**	**77**	**54**	**74**	**70**	**66**	**81**	**68**
	2007	89	84	76	79	80	66	74	68
By Race/Sex									
Asian	**2008**	**79**	**92**	**71**	**91**	**86**	**85**	**90**	**86**
	2007	96	95	89	94	92	88	87	88
African American	**2008**	**38**	**55**	**30**	**49**	**45**	**38**	**62**	**39**
	2007	76	68	53	57	60	40	50	38
Hispanic	**2008**	**41**	**66**	**37**	**61**	**55**	**52**	**69**	**52**
	2007	79	74	59	69	66	51	58	50
White	**2008**	**72**	**86**	**65**	**83**	**80**	**76**	**91**	**80**
	2007	95	91	86	87	89	77	84	81
Female	**2008**	**66**	**77**	**58**	**74**	**73**	**66**	**86**	**67**
	2007	91	85	79	80	84	67	81	68
Male	**2008**	**55**	**77**	**50**	**74**	**66**	**65**	**77**	**68**
	2007	87	83	73	78	77	66	67	69
By Status									
LEP	**2008**	**22**	**54**	**21**	**53**	**31**	**40**	**40**	**35**
	2007	62	61	34	57	38	38	27	31
Special Education	**2008**	**25**	**49**	**19**	**38**	**28**	**26**	**44**	**28**
	2007	64	60	38	47	45	29	33	29
Economically Disadvantaged	**2008**	**37**	**60**	**34**	**56**	**49**	**45**	**65**	**46**
	2007	76	70	54	63	61	45	52	45
% Correct for Proficient or Above	**2008**	**53**	**50**	**53**	**50**	**50**	**52**	**54**	**56**
	2007	39	46	42	44	44	33	55	50

*Note that performance standards and test changes have occurred from 2007 to 2008. These data only demonstrate the results from 2007 and 2008. However, these data should not be used for comparisons between the years.

State Board of Education Review and Adoption

Measurement Incorporated believes and can document that the standard setting process for NJ ASK 5-8 was sound, both in conception and execution, representative of the highest standards in contemporary educational measurement, and representative of standards operating among state assessment systems nationwide; that the participants, New Jersey teachers, found it to be so; and that, as New Jersey's assessment vendor, with wide experience implementing assessment programs in other states, MI stands behind the validity of the NJ ASK standard setting results and the process which produced them, and is prepared to assist the NJ DOE in communicating this validity to stakeholders and federal peer reviewers.

On July 16, Deputy Commissioner Willa Spicer, Dr. Jay Doolan, Dr. Timothy Peters, and Dr. Michael Bunch presented the information in Tables 6.3.2 and 6.3.3 to the Board, along with a formal recommendation to adopt the cut scores shown in Table 6.3.1. The Board approved the cut scores without modification.

PART 7: ITEM and TEST STATISTICS

7.1 Classical Item Statistics

For each administration, classical item analyses are completed prior to item calibration, scaling, and equating. These statistics are calculated again once all of the data are available. These analyses involve computing, for every item in each form, a set of statistics based on classical test theory. Each statistic is designed to provide some key information about the quality of each item from an empirical perspective. The statistics estimated for the NJ ASK are described below.

- Classical item difficulty ("P-Value"):
  This statistic indicates the percentage of examinees in the sample that answered the item correctly. Desired p-values generally fall within the range of 0.30 to 0.90.

- Item discrimination ("r-biserial"):
  This statistic is measured by the poly-serial correlation between the item score and the test criterion score and describes the relationship between performance on the specific item and performance on the entire form. Higher values indicate greater differences in the performance of competent and less competent examinees. Items with negative correlations can indicate serious problems with the item content (e.g., multiple correct answers or unusually complex content), or can indicate that students have not been taught the content. For LAL, the test criterion score is the total score of all reading items (MC and CR) and the writing prompt. For mathematics, the test criterion score is the total score of all MC and CR (Extended Constructed Response (ECR) and Short Constructed Response (SCR)) items. For science, the test criterion score is also the total score of all MC and CR items.

- The proportion of students choosing each response option:
  These statistics indicate the percentage of examinees that select each of the available answer options and the percentage of examinees that omitted the item.

- Distractor analyses for MC items:
  A SAS Macro is used to report the percentage of examinees who select each incorrect response (distractor).

- Percentage of students omitting an item:
  This statistic is useful for identifying problems with test features such as testing time and item/test layout. Typically, we would expect that if students have an adequate amount of testing time, 95% of students should attempt to answer each question. When a pattern of omit percentages exceeds 5% for a series of items at the end of a timed section, this may indicate that there was insufficient time for students to complete all items. Alternatively, if the omit percentage is greater than 5% for a single item, this could be an indication of an item/test layout problem. For example, students might accidentally skip an item that follows a lengthy stem.

Item analyses were conducted for the 2008 NJ ASK 5-8 in the content areas of LAL, mathematics, and science. In this section, summary information is presented by grade at both the content domain and content cluster level. The information includes mean item scores and discrimination indices, as well as descriptive statistics for number correct raw score and for scale scores. Statistics include N-counts, means, standard deviations, minimum and maximum values, and a variety of data disaggregations, including student demographic group and District Factor Group (DFG).

For multiple-choice (MC) items, the mean score is simply the proportion of students who gave a correct response to the item (usually referred to as item difficulty or the p-value), and the discrimination index is the point biserial correlation between the item score and the total score based on the remaining items. For LAL, the test criterion score was the total score of all reading items (MC and CR) and the writing prompt. For mathematics, the test criterion score was the total score of all MC and CR (Extended Constructed Response (ECR) and Short Constructed Response (SCR)) items. For science, the test criterion score was also the total score of all MC and CR items.

For constructed-response (CR) items, the mean score is the mean of students' scores on a scale of 0 to 3 for the ECR items and a scale of 0 to 1 for the SCR mathematics items. The mean scores for the science CR items are based on a 0 to 3 point scale; whereas, the LAL CR mean scores are based on a 0 to 4 point scale. Writing is scored on a scale of 0 to 5 for grade 5 and 0 to 6 for grades 6 and 7. Note that the writing scores were summed for the Persuasive prompt and averaged for the Speculative prompt in data analyses and score reporting. The discrimination index is the correlation between the item score and the total score based on the remaining items.

Descriptive Statistics

Tables 7.1.1 through 7.1.4 summarize by item response format, item difficulty, and discrimination of the items that comprise each content domain and cluster for grades 5 through 8, respectively. For MC items, both the mean and standard deviation are given. The mean value is the average of the p-values of the items in the cluster. For CR items, the mean value is the average item score for the items in the cluster. Item discrimination is the correlation between students' item score and the total score of the remaining items on the test. Both item difficulty and discrimination are expressed in terms of the raw score metric.

Tables 7.1.5, through 7.1.8 summarize frequency distributions for MC item difficulty and discrimination indices of items comprising each content domain and cluster for grades 5, 6, 7, and 8, respectively. The median item difficulty and discrimination is also displayed.

Table 7.1.9 summarizes distractor analyses for MC items by test. The number in each cell indicates the number of items where at least one p-value or discrimination index (point-biserial) for the distractors was higher than the keyed option (answer identified as the correct response).

Table 7.1.1: Grade 5 - Item Difficulty and Discrimination Summary Statistics for Multiple-Choice and Constructed-Response Items by Content Area and Cluster

Test Section/ Cluster	Multiple-Choice					Constructed-Response*			
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
LAL	**36**	**0.66**	**0.15**	**0.37**					
					WT1	1	5.58		0.69
Writing					WT2	1	2.90		0.67
Reading	36	0.66	0.15	0.37		6	1.57	0.12	0.58
Working with Text	15	0.74	0.09	0.40		2	1.65	0.02	0.57
Analyzing Text	21	0.61	0.17	0.35		4	1.53	0.14	0.58
Math	**32**	**0.67**	**0.16**	**0.38**	**SCR**	**6**	**0.69**	**0.11**	**0.47**
					ECR	**4**	**1.66**	**0.37**	**0.55**
Number and Numerical Operation	7	0.70	0.09	0.36	SCR	2	0.56	0.03	0.50
					ECR	1	1.59	-	0.51
Geometry and Measurement	7	0.62	0.12	0.37	SCR	2	0.71	0.10	0.50
					ECR	1	1.33	-	0.61
Patterns and Algebra	9	0.69	0.20	0.36	SCR	1	0.76	-	0.33
					ECR	1	2.29	-	0.50
Data Analysis, Probability, and Discrete Mathematics	9	0.67	0.16	0.42	SCR	1	0.81	-	0.48
					ECR	1	1.45	-	0.56
Problem Solving	*13*	*0.67*	*0.15*	*0.42*	*SCR*	*2*	*0.79*	*0.03*	*0.40*
					ECR	4	1.66	0.37	0.55

*In mathematics, the constructed-response (CR) items consists of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3. For LAL CR items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 5 for grade 5 and 0 to 6 for grades 6 through 8. Note that WT1 scores were summed and WT2 scores were averaged in data analyses and score reporting.

Table 7.1.2: Grade 6 - Item Difficulty and Discrimination Summary Statistics for Multiple-Choice and Constructed-Response Items by Content Area and Cluster

Test Section/ Cluster	Multiple-Choice				Constructed-Response*				
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
LAL	**36**	**0.67**	**0.16**	**0.38**					
					WT1	1	5.38		0.74
Writing					WT2	1	2.79		0.69
Reading	36	0.67	0.16	0.38		6	1.60	0.39	0.63
Working with Text	20	0.64	0.17	0.38		1	2.29		0.65
Analyzing Text	16	0.70	0.14	0.37		5	1.46	0.22	0.62
Math	**32**	**0.63**	**0.14**	**0.37**	**SCR**	**6**	**0.70**	**0.07**	**0.44**
					ECR	**4**	**1.62**	**0.30**	**0.59**
Number and	7	0.62	0.11	0.39	SCR	2	0.65	0.07	0.47
Numerical Operation					ECR	1	1.47	-	0.64
Geometry and	7	0.58	0.11	0.34	SCR	2	0.67	0.01	0.41
Measurement					ECR	1	1.25	-	0.58
Patterns and Algebra	9	0.62	0.15	0.42	SCR	1	0.79	-	0.47
					ECR	1	2.06	-	0.48
Data Analysis, Probability, and Discrete Mathematics	9	0.68	0.15	0.34	SCR	1	0.76	-	0.40
					ECR	1	1.70	-	0.67
Problem Solving	13	0.65	0.09	0.39	SCR	4	0.70	0.08	0.47
					ECR	4	1.62	0.30	0.59

*In mathematics, the constructed-response (CR) items consists of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3. For LAL CR items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 5 for grade 5 and 0 to 6 for grades 6 through 8. Note that WT1 scores were summed and WT2 scores were averaged in data analyses and score reporting.

Table 7.1.3: Grade 7 - Item Difficulty and Discrimination Summary Statistics for Multiple-Choice and Constructed-Response Items by Content Area and Cluster

Test Section/ Cluster	Multiple-Choice				Constructed-Response*				
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
LAL	**36**	**0.66**	**0.13**	**0.38**					
					WT1	1	5.91		0.75
Writing					WT2	1	2.95		0.75
Reading	36	0.66	0.13	0.38		6	1.85	0.12	0.62
Working with Text	21	0.66	0.13	0.40		1	1.98		0.64
Analyzing Text	15	0.66	0.14	0.34		5	1.82	0.11	0.62
Math	**32**	**0.64**	**0.16**	**0.38**	**SCR**	**8**	**0.62**	**0.14**	**0.48**
					ECR	**4**	**1.34**	**0.10**	**0.63**
Number and Numerical Operation	7	0.66	0.16	0.37	SCR	2	0.78	0.06	0.44
					ECR	1	1.51	0	0.53
Geometry and Measurement	7	0.56	0.12	0.38	SCR	2	0.56	0.07	0.51
					ECR	1	1.25	0	0.66
Patterns and Algebra	9	0.64	0.18	0.41	SCR	2	0.46	0.12	0.52
					ECR	1	1.30	0	0.70
Data Analysis, Probability, and Discrete Mathematics	9	0.69	0.13	0.36	SCR	2	0.67	0.02	0.44
					ECR	1	1.28	0	0.62
Problem Solving	11	0.62	0.19	0.38	SCR	3	0.55	0.16	0.48
					ECR	4	1.34	0.10	0.63

*In mathematics, the constructed-response (CR) items consists of short constructed response (SCR) items scored on a scale from 0 to 1 and extended constructed response (ECR) items scored on a scale from 0 to 3. For LAL CR items, the mean score is the mean of students' scores on a scale of 0 to 4. Writing is scored on a scale of 0 to 5 for grade 5 and 0 to 6 for grades 6 through 8. Note that WT1 scores were summed and WT2 scores were averaged in data analyses and score reporting.

Table 7.1.4: Grade 8 - Item Difficulty and Discrimination Summary Statistics for Multiple-Choice and Constructed-Response Items by Content Area and Cluster

Test Section/Cluster	Multiple-Choice					Constructed-Response*			
	Item Difficulty			Item Discrimination		Item Difficulty			Item Discrimination
	Nitem	Mean	S.D.	Mean		Nitem	Mean	S.D.	Mean
LAL	**36**	**0.77**	**0.12**	**0.40**					
					WT1	1	6.78		0.79
Writing					WT2	1	3.49		0.75
Reading	36	0.77	0.12	0.40		6	1.96	0.18	0.61
Working with Text	22	0.77	0.13	0.41		2	2.04	0.07	0.65
Analyzing Text	14	0.76	0.11	0.38		4	1.92	0.22	0.59
Math	**32**	**0.66**	**0.12**	**0.41**	**SCR**	**8**	**0.63**	**0.16**	**0.48**
					ECR	**4**	**1.74**	**0.35**	**0.63**
Number and	8	0.66	0.11	0.44	SCR	2	0.60	0.12	0.51
Numerical Operation					ECR	1	2.12	0	0.67
Geometry and Measurement	8	0.65	0.11	0.39	SCR	2	0.41	0.01	0.39
					ECR	1	1.32	0	0.62
Patterns and Algebra	8	0.68	0.13	0.45	SCR	2	0.69	0.07	0.54
					ECR	1	2.03	0	0.61
Data Analysis, Probability,	8	0.65	0.11	0.36	SCR	2	0.80	0..01	0.47
and Discrete Mathematics					ECR	1	1.47	0	0.62
Problem Solving	*19*	*0.67*	*0.13*	*0.42*	*SCR*	*6*	*0.61*	*0.18*	*0.45*
					ECR	4	1.74	0.35	0.63
Science	**45**	**0.63**	**0.08**	**0.36**		**3**	**1.05**	**0.04**	**0.49**
Life Science	18	0.64	0.08	0.36		1	0.92		0.51
Physical Science	13	0.62	0.08	0.32		1	1.11		0.45
Earth Science	14	0.62	0.07	0.39		1	1.12		0.51
Knowledge	9	0.65	0.08	0.38		0			
Application	36	0.62	0.07	0.35		3	1.05	0.04	0.49

* Science CR items are scored on a scale of 0 to 3. See note attached to Table 7.1.4 for more details.

Table 7.1.5: Grade 5 - Difficulty and Discrimination Indices by Content Area and Cluster Frequency Distributions for Multiple-Choice Items

		p-value						Discrimination					
	Nitem	Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	*pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
LAL	**36**	**0.65**	**1**	**3**	**23**	**9**	**0**	**0.38**	**3**	**3**	**14**	**15**	**1**
Working with Text	15	0.72	0	0	12	3	0	0.43	0	1	5	9	0
Analyzing Text	21	0.62	1	3	11	6	0	0.36	3	2	9	6	1
Math	**32**	**0.65**	**0**	**5**	**15**	**9**	**3**	**0.35**	**0**	**4**	**15**	**10**	**3**
Number and Numerical Operation	7	0.68	0	0	5	2	0	0.34	0	1	4	2	0
Geometry and Measurement	7	0.58	0	1	3	3	0	0.34	0	1	3	3	0
Patterns and Algebra	9	0.74	0	3	2	2	2	0.35	0	1	5	3	0
Data Analysis, Probability, and Discrete Mathematics	9	0.60	0	1	5	2	1	0.40	0	1	3	2	3
Problem Solving	*13*	*0.66*	*0*	*1*	*7*	*2*	*2*	*0.41*	*0*	*0*	*6*	*4*	*2*

* While ideally items should have a point-biserial of at least .20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 7.1.6: Grade 6 - Difficulty and Discrimination Indices by Content Area and Cluster Frequency Distributions for Multiple-Choice Items

	Nitem	p-value						Discrimination					
		Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	*pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
LAL	**36**	**0.69**	**0**	**7**	**17**	**11**	**1**	**0.37**	**2**	**6**	**12**	**11**	**5**
Working with Text	20	0.65	0	5	10	4	1	0.36	1	5	5	4	5
Analyzing Text	16	0.70	0	2	7	7	0	0.39	1	1	7	7	0
Math	**32**	**0.66**	**0**	**5**	**22**	**5**	**0**	**0.37**	**0**	**4**	**15**	**11**	**2**
Number and Numerical Operation	7	0.66	0	1	6	0	0	0.39	0	0	4	2	1
Geometry and Measurement	7	0.52	0	1	5	1	0	0.33	0	1	4	2	0
Patterns and Algebra	9	0.71	0	2	6	1	0	0.44	0	1	1	6	1
Data Analysis, Probability, and Discrete Mathematics	9	0.73	0	1	5	3	0	0.33	0	2	6	1	0
Problem Solving	*13*	*0.66*	*0*	*0*	*11*	*2*	*0*	*0.41*	*0*	*1*	*5*	*6*	*1*

* While ideally items should have a point-biserial of at least .20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 7.1.7: Grade 7 - Difficulty and Discrimination Indices by Content Area and Cluster Frequency Distributions for Multiple-Choice Items

	Nitem	p-value						Discrimination					
		Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	*pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
LAL	**36**	**0.65**	**0**	**5**	**21**	**10**	**0**	**0.39**	**3**	**6**	**10**	**14**	**3**
Working with Text	21	0.66	0	3	13	5	0	0.43	2	2	3	12	2
Analyzing Text	15	0.63	0	2	8	5	0	0.34	1	4	7	2	1
Math	**32**	**0.68**	**0**	**7**	**16**	**9**	**0**	**0.40**	**2**	**4**	**9**	**14**	**3**
Number and Numerical Operation	8	0.69	0	1	5	2	0	0.41	2	0	1	3	2
Geometry and Measurement	8	0.60	0	3	5	0	0	0.41	0	2	1	5	0
Patterns and Algebra	8	0.71	0	2	3	3	0	0.43	0	1	1	6	0
Data Analysis, Probability, and Discrete Mathematics	8	0.72	0	1	3	4	0	0.36	0	1	6	0	1
Problem Solving	*11*	*0.69*	*0*	*3*	*4*	*4*	*0*	*0.39*	*1*	*1*	*4*	*3*	*2*

* While ideally items should have a point-biserial of at least .20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 7.1.8: Grade 8 - Difficulty and Discrimination Indices by Content Area and Cluster Frequency Distributions for Multiple-Choice Items

	Nitem	P-Value						Discrimination					
		Median	p < 0.25	0.25 <= p < 0.50	0.50 <= p < 0.75	0.75 <= p < 0.90	p >= 0.90	Median	pb < 0.20	0.20 <= pb < 0.30	0.30 <= pb < 0.40	0.40 <= pb < 0.50	pb >= 0.50
LAL	**36**	**0.80**	**0**	**1**	**12**	**19**	**4**	**.46**	**0**	**4**	**13**	**17**	**2**
Working with Text	22	0.82	0	1	6	12	3	0.40	0	0	10	12	0
Analyzing Text	14	0.78	0	0	6	7	1	0.39	0	4	3	5	2
Math	**32**	**0.65**	**0**	**2**	**25**	**4**	**1**	**0.40**	**0**	**2**	**11**	**14**	**5**
Number and Numerical Operation	8	0.65	0	0	7	1	0	0.43	0	0	3	4	1
Geometry and Measurement	8	0.67	0	1	6	1	0	0.40	0	0	3	5	0
Patterns and Algebra	8	0.67	0	0	6	1	1	0.43	0	0	1	5	2
Data Analysis, Probability, and Discrete Mathematics	8	0.65	0	1	6	1	0	0.33	0	2	4	0	2
Problem Solving	*19*	*0.66*	*0*	*1*	*14*	*3*	*1*	*0.40*	*0*	*1*	*7*	*8*	*3*
Science	**45**	**0.62**	**0**	**2**	**42**	**1**	**0**	**.036**	**1**	**10**	**22**	**11**	**1**
Life Science	18	0.63	0	1	17	0	0	0.37	1	2	11	4	0
Physical Science	13	0.63	0	0	12	1	0	0.36	0	4	5	3	1
Earth Science	14	0.62	0	1	13	0	0	0.36	0	4	6	4	0
Knowledge	9	0.64	0	0	9	0	0	0.38	0	1	6	2	0
Application	36	0.62	0	2	33	1	0	0.36	1	9	16	9	1

* While ideally items should have a point-biserial of at least .20, these items had acceptable p-values and were retained to preserve adequate content coverage at the cluster level.

Table 7.1.9: Number of Multiple-Choice Items Flagged by Distractor Analyses

Test	Grade	N-item	P-value*	Point-Biserial*
LAL	5	36	2	1
	6	36	1	1
	7	36	1	0
	8	36	0	0
Math	5	32	0	0
	6	32	1	0
	7	32	1	0
	8	32	0	0
Science	8	45	0	0

* The p-value and point-biserial in this table are calculated in the same way as for a correct answer, except in this case the distractor is used instead of the correct answer.

7.2 Speededness

The consequence of time limits on examinee's scores is called speededness. An examination is "speeded" to the degree that those taking the exam score lower than they would have had the test not been timed. Most speededness statistics are based on the number of items that were not attempted by students. In each separately timed subsection of a test, if a student does not attempt the last item of the test, it can be assumed that the student may have run out of time before reaching the last item. The percentage of students omitting an item provides information about speededness, although it must be kept in mind that students can omit an item for reasons other than speededness (for example, choosing to not put effort into answering a constructed response item). Thus, if the percentage of omits is low, that implies that there is little speededness; if a percentage of omits is high, speededness, as well as other factors, may be the cause.

The NJ ASK was not designed to be a speeded test, but rather a power test. That is, all students are expected to have ample time to finish all items and prompts. As the tests were administered over four days, with multiple sessions each day, students were assumed to have enough time to complete the test. The LAL test consists of reading passages, MC items, CR items, and writing tasks. Students were given 1 hour 55 minutes to respond to a single writing prompt, 18 MC, and 3 CR items on the first day and 2 hours 20 minutes to complete the same number of items on the second day in grades 5 through 8.

On the third day, students were given 51 minutes in grades 5 and 6 to answer 6 SCR, 12 MC, and 2 CR items in mathematics. On day four, fifth and sixth graders were given 1 hour 9 minutes to complete 20 MC and 2 CR mathematics items. Students in grade 7 were allowed 55 minutes to complete 8 SCR, 12 MC, and 2 CR items on day three and 20 MC and 2 CR mathematics items on the fourth day within 1 hour 9 minutes. The Grade 8

mathematics test was administered on day three only, with 2 hours 13 minutes to answer 8 SCR, 32 MC, and 4 CR items.

The science test consists of MC and CR items. The science test, applicable to Grade 8 only, was administered over a one-day period (day four) requiring students to respond to 45 MC and 3 CR items within a 2 hour time period.

Table 7.2.1 presents the percentage of students omitting the last MC item in each test session. For the LAL and science tests, less than one percent of students omitted the last MC item in each session, whereas in mathematics, less than two percent of students omitted the last MC item.

Table 7.2.1: Percentage of Students Omitting the Last MC Item in Each Test Session

Grade	Day	Content Area	Location	%
5	1	Math	MC 20	1.66
		LAL	MC 20	0.37
	2	Math	MC 43	0.71
		LAL	MC 40	0.52
6	1	Math	MC 20	1.49
		LAL	MC 20	0.54
	2	Math	MC 43	0.73
		LAL	MC 40	0.45
7	1	Math	MC 22	0.99
		LAL	MC 20	0.54
	2	Math	MC 45	0.87
		LAL	MC 40	0.80
8	1	Math	MC 45	0.58
		LAL	MC 20	0.51
	2	LAL	MC 40	0.53
	3	Science	MC 47	0.20

7.3 Intercorrelations

The Pearson product-moment correlations between the content areas and test sections/clusters are presented in Tables 7.3.1 -7.3.4. Generally, the more items a cluster (standard) has, the higher the correlation with the total score. After all, the cluster (standard) makes up more of the points of the total score. For example, the Reading total score at grade 5 is highly correlated with the LAL score (.99) because the Reading score makes up 60 of the 75 possible points for LAL. In mathematics at grade 5, the correlation between the Math 5 and the total mathematics score is 0.96. This is due in

part to the fact that Math 5 consists of the items identified as Problem Solving. These items account for 27 of the 50 possible total points for mathematics.

These tables illustrate, as expected, a higher correlation between clusters within content areas than clusters from different content areas. For example, at grade 5, the lowest correlations within in the LAL clusters is .54 between the Persuasive writing prompt (WT1) and the Reading items (LA1 and LA2). The correlations between WT1 and the mathematics clusters range from .42 to .48.

Table 7.3.1: Grade 5 Correlation Coefficients among Content Domains and Clusters

	LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5
LAL	1.00												
Writing	0.75	1.00											
*WT1	0.69	0.97	1.00										
(WT2)	0.67	0.80	0.62	1.00									
Reading	0.99	0.62	0.56	0.59	1.00								
LAL1	0.95	0.59	0.54	0.56	0.96	1.00							
LAL2	0.92	0.59	0.54	0.56	0.93	0.80	1.00						
Math	0.76	0.55	0.50	0.51	0.75	0.72	0.70	1.00					
Math 1	0.64	0.48	0.44	0.45	0.63	0.61	0.59	0.88	1.00				
Math 2	0.66	0.46	0.42	0.43	0.66	0.64	0.60	0.89	0.69	1.00			
Math 3	0.66	0.48	0.44	0.45	0.66	0.63	0.62	0.86	0.68	0.68	1.00		
Math 4	0.70	0.51	0.47	0.47	0.69	0.66	0.64	0.89	0.71	0.72	0.70	1.00	
Math 5	0.72	0.53	0.48	0.49	0.71	0.69	0.66	0.96	0.85	0.85	0.82	0.84	1.00

*WT1 = Persuasive Writing Prompt, WT2 = Speculative Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing Text, Math 1 = Number & Numerical Operations, Math 2 = Geometry & Measurement, Math 3 = Patterns & Algebra, Math 4 = Data Analysis, Probability, & Discrete Mathematics, Math 5 =Problem Solving

Table 7.3.2: Grade 6 Correlation Coefficients among Content Domains and Clusters

	LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5
LAL	1.00												
Writing	0.80	1.00											
*WT1	0.74	0.97	1.00										
(WT2)	0.69	0.78	0.60	1.00									
Reading	0.99	0.69	0.64	0.62	1.00								
LAL1	0.95	0.69	0.64	0.62	0.96	1.00							
LAL2	0.92	0.61	0.57	0.55	0.94	0.79	1.00						
Math	0.78	0.61	0.57	0.53	0.78	0.73	0.74	1.00					
Math 1	0.69	0.53	0.50	0.46	0.68	0.64	0.65	0.89	1.00				
Math 2	0.66	0.52	0.49	0.46	0.65	0.61	0.62	0.86	0.69	1.00			
Math 3	0.71	0.55	0.52	0.48	0.70	0.67	0.67	0.89	0.73	0.68	1.00		
Math 4	0.70	0.55	0.51	0.47	0.70	0.66	0.66	0.89	0.73	0.68	0.72	1.00	
Math 5	0.76	0.60	0.56	0.52	0.75	0.71	0.72	0.97	0.90	0.78	0.86	0.87	1.00

*WT1 = Persuasive Writing Prompt, WT2 = Speculative Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing Text, Math 1 = Number & Numerical Operations, Math 2 = Geometry & Measurement, Math 3 = Patterns & Algebra, Math 4 = Data Analysis, Probability, & Discrete Mathematics, Math 5 =Problem Solving

Table 7.3.3: Grade 7 Correlation Coefficients among Content Domains and Clusters

	LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5
LAL	1.00												
Writing	0.79	1.00											
*WT1	0.75	0.96	1.00										
(WT2)	0.65	0.79	0.60	1.00									
Reading	0.99	0.68	0.64	0.56	1.00								
LAL1	0.94	0.67	0.63	0.56	0.95	1.00							
LAL2	0.92	0.61	0.58	0.50	0.94	0.78	1.00						
Math	0.77	0.60	0.57	0.49	0.77	0.71	0.73	1.00					
Math 1	0.65	0.52	0.50	0.43	0.64	0.60	0.61	0.86	1.00				
Math 2	0.68	0.52	0.49	0.42	0.67	0.63	0.64	0.90	0.69	1.00			
Math 3	0.71	0.55	0.52	0.45	0.70	0.65	0.67	0.91	0.72	0.75	1.00		
Math 4	0.70	0.54	0.51	0.44	0.69	0.64	0.67	0.87	0.68	0.71	0.72	1.00	
Math 5	0.75	0.58	0.55	0.48	0.74	0.69	0.70	0.96	0.84	0.86	0.87	0.83	1.00

*WT1 = Persuasive Writing Prompt, WT2 = Speculative Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing Text, Math 1 = Number & Numerical Operations, Math 2 = Geometry & Measurement, Math 3 = Patterns & Algebra, Math 4 = Data Analysis, Probability, & Discrete Mathematics, Math 5 =Problem Solving

Table 7.3.4: Grade 8 Correlation Coefficients among Content Domains and Clusters

		LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5	Science	Earth	Life	Physical	Application	Knowledge
LAL		1.00																		
Writing		0.84	1.00																	
	*WT1	0.79	0.97	1.00																
	(WT2)	0.75	0.83	0.66	1.00															
Reading		0.99	0.75	0.70	0.68	1.00														
	LAL1	0.94	0.72	0.67	0.66	0.94	1.00													
	LAL2	0.95	0.71	0.66	0.65	0.96	0.81	1.00												
Math		0.74	0.62	0.58	0.55	0.74	0.68	0.72	1.00											
	Math 1	0.68	0.57	0.53	0.50	0.67	0.62	0.66	0.91	1.00										
	Math 2	0.63	0.52	0.48	0.46	0.62	0.57	0.61	0.89	0.75	1.00									
	Math 3	0.71	0.59	0.55	0.53	0.70	0.65	0.68	0.92	0.80	0.75	1.00								
	Math 4	0.67	0.56	0.52	0.50	0.66	0.61	0.65	0.89	0.75	0.72	0.76	1.00							
	Math 5	0.73	0.61	0.57	0.54	0.73	0.67	0.71	0.98	0.91	0.88	0.90	0.85	1.00						
Science		0.73	0.57	0.53	0.51	0.73	0.67	0.72	0.79	0.72	0.72	0.72	0.69	0.78	1.00					
	Earth	0.64	0.49	0.46	0.44	0.65	0.59	0.64	0.72	0.66	0.66	0.66	0.63	0.71	0.91	1.00				
	Life	0.70	0.55	0.51	0.50	0.70	0.65	0.69	0.73	0.66	0.65	0.67	0.64	0.71	0.92	0.75	1.00			
	Physical	0.63	0.50	0.46	0.45	0.63	0.57	0.62	0.69	0.63	0.63	0.63	0.60	0.68	0.88	0.71	0.71	1.00		
	Application	0.72	0.57	0.53	0.51	0.73	0.66	0.72	0.79	0.71	0.71	0.72	0.69	0.77	0.99	0.90	0.91	0.88	1.00	
	Knowledge	0.60	0.46	0.43	0.41	0.61	0.55	0.60	0.65	0.59	0.59	0.60	0.57	0.64	0.83	0.76	0.78	0.70	0.74	1.00

*WT1 = Persuasive Writing Prompt, WT2 = Speculative Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing Text, Math 1 = Number & Numerical Operations, Math 2 = Geometry & Measurement, Math 3 = Patterns & Algebra, Math 4 = Data Analysis, Probability, & Discrete Mathematics, Math 5 =Problem Solving

7.4 DIF Analysis

Using data from the field test items embedded in the 2008 operational test, Differential Item Functioning (DIF) was examined with the Mantel-Haenszel (1959)[2] procedure for the MC items and CR items. DIF analyses were conducted on the items field tested items in the Fall of 2007, also. Results for the 2008 embedded field tested items are summarized in Table 7.4.1. Though not presented in Table 7.4.1, results form the stand alone field test of 2007 were very similar. As all items must be field tested and scrutinized including DIF analyses prior to appearing as an operational item, DIF analyses are not conducted on operational items.

For DIF analyses, all members of the reference group (typically male/majority) are compared against all members of the focal group (typically female/minority). The DIF analyses conducted for NJ ASK 5-8 focused on gender and ethnicity. Tables 7.5.7 through 7.5.15 indicate the number of examinees, depending on group membership, involve in the DIF analyses.

The Mantel-Haenszel (MH) method is a non-parametric approach to DIF. In the MH procedure, total raw scores are held constant while the odds ratio is estimated. The ETS categorization is applied to flag the significance of DIF effects (Dorans & Holland, 1993)[3]. DIF analyses are detailed in Section 2.2 - Development of Test Items. The letters A, B, and C are used to denote the ETS categorizations. A indicates a smaller degree of DIF, B indicates moderated DIF, and C indicates larger differences in the performance of the reference and focal groups on a given item.

[2] Mantel, N. & Haenszel, W. (1959). Statistical aspects of the analysis of data from retrospective studies of disease. *Journal of National Cancer Institute*, 22, 719-748.

[3] Dorans, N. J. & Holland, P. W. (1993). DIF detection and description: Mantel-Haenszel and standardization. In P. W. Holland & H. Wainer (Eds.), *Differential item functioning* (pp. 35-66). Hillsdale, NJ: Lawrence Erlbaum.

Table 7.4.1: Frequency Distribution of DIF Categories by Item Type and Grade Level**
2007 NJ ASK Field Tested Items

Test	Grade	Group	Multiple Choice*			Constructed-Response*		
			A**	B**	C**	A**	B**	C**
LAL	5	M/F***	25	1	0	3	1	0
		W/B***	20	5	1	4	0	0
		W/H***	18	0	0	4	0	0
	6	M/F	19	1	0	2	0	0
		W/B	13	4	3	2	0	0
		W/H	9	1	0	2	0	0
	7	M/F	16	4	0	0	0	0
		W/B	16	3	1	0	0	0
		W/H	11	0	0	0	0	0
	8	M/F	26	0	0	0	0	0
		W/B	19	5	2	0	0	0
		W/H	8	0	0	0	0	0
Math	5	M/F	21	0	0	0	0	0
		W/B	19	2	0	0	0	0
		W/H	20	1	0	0	0	0
	6	M/F	28	4	0	6	4	0
		W/B	32	0	0	10	0	0
		W/H	29	3	0	9	1	0
	7	M/F	28	3	1	12	0	0
		W/B	30	2	0	11	0	1
		W/H	27	4	1	11	1	0
	8	M/F	16	0	1	0	0	0
		W/B	16	0	1	0	0	0
		W/H	16	0	1	0	0	0
Science	8	M/F	35	0	0	0	0	0
		W/B	0	0	0	0	0	0
		W/H	35	0	0	0	0	0

*The Mantel-Haenszel procedure is applied for the MC and CR items.

**DIF categories: A, negligible; B, slight to moderate; and C, moderate to severe.

***DIF contrast groups: M/F, Male versus Female; W/B, White versus Black; and W/H, White versus Hispanic.

****Counts do not necessarily equal total number of items on each test as these data (2007 DIF analyses on field-test items) were computed by multiple vendors with different methods of reporting DIF.

7.5 Summary Statistics

Descriptive Statistics for Total Raw Score

Descriptive statistics of total scores for NJ ASK 2008 are summarized in Table 7.5.1 by test content, form, and grade level. A total of 415,918 students participated in the LAL grades 5–8 tests, 411,502 students participated in the mathematics grades 5–8 tests, and 103,929 students participated in the science grade 8 test.

Table 7.5.1: Descriptive Statistics for Total Raw Scores by Content Area and Grade Level

Test	Grade	Form	N	Mean	STD	Min	Max	Nitem	Max Possible
LAL	5	OP	100700	41.32	10.69	0	71	44	75
	6	OP	101216	41.83	10.50	0	72.5	44	78
	7	OP	106143	43.70	10.78	0	73	44	78
	8	OP	104864	49.63	10.02	0	73.5	44	78
	6	AL	90	35.24	10.69	12	54	44	78
	5	LP	94	32.85	12.63	8	57	44	75
	6	LP	74	33.19	13.84	8	58	44	78
	7	LP	77	33.31	11.10	9	54	44	78
	8	LP	70	40.96	15.38	7	64	44	78
	5	SP	554	27.36	9.78	1	58	44	75
	6	SP	660	26.31	9.57	5	55.5	44	78
	7	SP	713	29.58	8.99	2	56	44	78
	8	SP	663	37.04	9.85	2	60	44	78
Math	5	OP	101093	32.26	9.93	1	50	42	50
	6	OP	101593	30.82	10.37	1	50	42	50
	7	OP	102431	30.85	11.00	1	52	44	52
	8	OP	103274	33.22	11.41	1	52	44	52
	6	AL	90	25.96	8.29	8	47	42	50
	5	BR	7	24.14	10.24	8	41	41	47
	6	BR	2	10.00	2.83	8	12	40	46
	7	BR	8	33.38	10.24	19	47	43	49
	8	BR	5	21.60	15.66	6	39	43	49

Table 7.5.1 (continued): Descriptive Statistics for Total Raw Scores by Content Area and Grade Level

Test	Grade	Form	N	Mean	STD	Min	Max	Nitem	Max Possible
Math	5	LP	93	27.85	11.38	5	49	42	50
	6	LP	72	25.67	11.88	5	45	42	50
	7	LP	74	20.85	11.27	4	48	44	52
	8	LP	72	23.79	14.96	4	51	44	52
	5	SP	574	17.37	7.94	2	43	42	50
	6	SP	670	16.85	8.02	2	49	42	50
	7	SP	748	16.71	8.09	2	50	44	52
	8	SP	696	17.20	8.73	3	46	44	52
Science	8	OP	103912	31.46	10.43	1	54	48	57
	8	BR	5	22.60	10.69	10	35	45	51
	8	LP	73	25.16	10.97	8	49	48	57
	8	SP	690	18.62	6.72	2	44	48	57

*OP: Operational Test; AL: Alternative Operational Test; BR: Braille; and LP: Large Print SP: Spanish Version.

Descriptive Statistics for Total Raw Scores by Cluster

Tables 7.5.2 through 7.5.5 summarize the means and standard deviations for number correct raw score by cluster for the 2008 NJ ASK operational test forms.

Table 7.5.2: Grade 5 Means and Standard Deviations for Number Correct Raw Score – Operational Forms Including Spanish Version

	Number of Items			Number of Possible Points	Raw Score		Average Percent Correct
	MC	CR	SCR		Mean	Standard Deviation	
LAL	**36**	**8**		**75**	**41.23**	**10.74**	**54.97%**
Writing		2		15	8.48	2.54	56.53%
Reading	36	6		60	32.75	9.13	54.58%
Working with Text	15	2		23	13.77	4.06	59.87%
Analyzing Text	21	4		37	18.98	5.57	51.30%
Math	**32**	**4**	**6**	**50**	**32.17**	**9.98**	**64.34%**
Number & Numerical Operations	*7*	*1*	*2*	12	7.59	2.82	63.25%
Geometry & Measurement	*7*	*1*	*2*	12	7.08	3.03	59.00%
Patterns & Algebra	*9*	*1*	*1*	13	9.22	2.62	70.92%
Data Analysis, Probability, & Discrete Mathematics	*9*	*1*	*1*	13	8.27	2.89	63.62%
Problem Solving	13	4	2	27	14.87	5.13	64.65%

Table 7.5.3: Grade 6 Means and Standard Deviations for Number Correct Raw Score – Operational Forms Including Spanish Version

	Number of Items			Number of Possible Points	Raw Score		Average Percent Correct
	MC	CR/ECR	SCR		Mean	Standard Deviation	
LAL	**36**	**8**		**78**	**41.71**	**10.58**	**53.47%**
Writing		2		18	8.17	2.50	45.39%
Reading	**36**	**6**		60	33.54	8.87	55.90%
Working with Text	20	1		24	15.07	4.22	62.79%
Analyzing Text	16	5		36	18.47	5.14	51.31%
Math	**32**	**4**	**6**	**50**	**30.72**	**10.42**	**61.44%**
Number & Numerical Operations	7	1	2	12	7.11	3.03	59.24%
Geometry & Measurement	7	1	2	12	6.62	2.81	55.13%
Patterns & Algebra	9	1	1	13	8.42	3.08	64.73%
Data Analysis, Probability, & Discrete Mathematics	9	1	1	13	8.58	2.90	66.02%
Problem Solving	13	4	4	29	16.41	6.03	63.12%

Table 7.5.4: Grade 7 Means and Standard Deviations for Number Correct Raw Score – Operational Forms Including Spanish Version

	Number of Items			Number of Possible Points	Raw Score		Average Percent Correct
	MC	CR/ECR	SCR		Mean	Standard Deviation	
LAL	**36**	**8**		**78**	**43.59**	**10.84**	**55.88%**
Writing		2		18	8.86	2.60	49.22%
Reading	**36**	**6**		60	34.73	9.09	57.88%
Working with Text	21	1		25	15.75	4.74	63.00%
Analyzing Text	15	5		35	18.98	4.89	54.23%
Math	**32**	**4**	**8**	**52**	**30.75**	**11.05**	**59.13%**
Number & Numerical Operations	8	1	2	13	8.39	2.77	64.51%
Geometry & Measurement	8	1	2	13	6.87	3.35	52.81%
Patterns & Algebra	8	1	2	13	7.37	3.32	56.69%
Data Analysis, Probability, & Discrete Mathematics	8	1	2	13	8.79	3.20	67.59%
Problem Solving	11	4	3	26	13.86	6.05	53.32%

Table 7.5.5: Grade 8 Means and Standard Deviations for Number Correct Raw Score – Operational Forms Including Spanish Version

	Number of Items			Number of Possible Points	Raw Score		Average Percent Correct
	MC	CR/ECR	SCR		Mean	Standard Deviation	
LAL	**36**	**8**		**78**	**49.54**	**10.07**	**63.53%**
Writing		2		18	10.27	2.50	57.06%
Reading	**36**	**6**		60	39.27	8.22	65.47%
Working with Text	22	2		30	21.03	4.69	70.10%
Analyzing Text	14	4		30	18.25	3.94	60.83%
Math	**32**	**4**	**8**	**52**	**33.11**	**11.48**	**63.67%**
Number & Numerical Operations	8	1	2	13	8.65	3.29	66.51%
Geometry & Measurement	8	1	2	13	7.33	3.34	56.38%
Patterns & Algebra	8	1	2	13	8.89	3.22	68.38%
Data Analysis, Probability, & Discrete Mathematics	8	1	2	13	8.24	2.86	63.42%
Problem Solving	19	4	6	37	21.87	7.76	64.33%
Science	**45**	**3**		**54**	**31.37**	**10.47**	**55.04%**
Life Science	*18*	*1*		21	12.53	4.29	56.95%
Physical Science	*13*	*1*		16	9.21	3.45	54.18%
Earth Science	*14*	*1*		17	9.62	3.84	53.44%
Knowledge	*9*			9	5.81	2.15	64.55%
Application	36	3		45	25.55	8.77	53.23%

Scale Score Distributions by Content Area and Grade

Descriptive statistics for scale scores and percentage distributions of students' performance levels are summarized in Table 7.5.6 by content area and grade. LAL, mathematics, and science student records flagged as void, not present, or missing were removed. For all test forms, scale scores have a range of 100 to 300. A student is classified as Partially Proficient (PP) if his/her scale score is lower than 200. A student is classified as Advanced Proficient (AP) if his/her scale score is 250 or higher. The other students are classified as Proficient (P).

Table 7.5.6: Descriptive Statistics for Scale Scores and Percentage Distributions of Students' Performance Levels by Content Area and Grade

Test	Grade	Form	N	Mean	StdDev	Min	Max	%PP	%P	%AP
LAL	5	OP	100700	204.99	26.64	100	300	39.80	56.06	4.15
	6	OP	101216	202.21	25.46	100	300	42.56	55.05	2.39
	7	OP	106143	215.84	32.15	100	300	29.13	56.10	14.77
	8	OP	104864	220.03	25.15	100	300	18.82	69.81	11.38
	6	AL	90	186.47	24.48	133	232	65.56	34.44	0.00
	5	LP	94	184.68	29.89	123	248	68.09	31.91	0.00
	6	LP	74	181.88	32.41	121	246	66.22	33.78	0.00
	7	LP	77	186.09	28.95	121	246	61.04	38.96	0.00
	8	LP	70	201.97	34.71	129	270	48.57	41.43	10.00
	5	SP	554	171.78	22.79	100	252	88.45	11.37	0.18
	6	SP	660	166.10	21.89	109	237	92.88	7.12	0.00
	7	SP	713	176.30	23.18	100	254	82.89	16.97	0.14
	8	SP	663	190.54	19.73	100	250	69.53	30.32	0.15
Math	5	OP	101093	225.84	36.65	100	300	23.30	48.67	28.03
	6	OP	101593	219.31	35.02	100	300	33.22	52.81	13.97
	7	OP	102431	213.75	39.74	100	300	20.31	47.80	31.88
	8	OP	103274	217.70	43.89	100	300	16.39	38.30	45.30
	6	AL	90	203.28	25.81	144	292	42.22	52.22	5.56
	5	BR	7	200.57	37.50	139	264	57.14	28.57	14.29
	6	BR	2	149.50	12.02	141	158	100.00	0.0	0.0
	7	BR	8	242.63	37.58	194	300	12.50	50.00	37.50
	8	BR	5	175.60	58.86	110	240	60.00	40.00	0.0
	5	LP	93	210.02	41.54	117	300	40.86	40.86	18.28
	6	LP	72	201.49	37.78	126	273	47.22	41.67	11.11
	7	LP	74	177.27	41.33	100	287	71.62	22.97	5.41
	8	LP	72	182.64	58.65	100	300	61.11	22.22	16.67
	5	SP	574	172.97	28.79	100	264	81.36	18.12	0.52
	6	SP	670	174.82	26.08	100	300	82.84	16.42	0.75
	7	SP	748	163.57	29.82	100	300	86.23	13.10	.67
	8	SP	696	159.02	32.25	100	268	88.94	10.06	1.01
Science	8	OP	103912	232.90	32.62	100	300	15.76	51.83	32.42
	8	BR	5	203.00	32.47	164	241	40.00	60.00	0.00
	8	LP	73	213.73	34.00	156	300	31.51	52.05	16.44
	8	SP	690	193.87	20.86	104	272	62.46	36.09	1.45

*OP: Operational Test; AL: Alternative Operational Test; BR: Braille; and LP: Large Print SP: Spanish Version

Scale Score Distributions by Demographic Group

Descriptive statistics of scale scores and percentage distributions of students' performance levels by demographic groups are summarized in Tables 7.5.7 through 7.5.15 by content area and grade. Scale score cumulative frequency distributions are attached as Appendix E.

Table 7.5.7: Descriptive Statistics for Grade 5 LAL Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	102,924	720	154	554	101,496	40,681	40.1	56,636	55.8	4,179	4.1	204.7
General Education [5]	83,414	0	78	110	83,226	26,714	32.1	52,422	63.0	4,090	4.9	210.0
Special Education	16,703	720	50	95	15,838	11,967	75.6	3,787	23.9	84	0.5	181.1
Limited English Proficient [6]	4,445	15	28	356	4,046	3,148	77.8	886	21.9	12	0.3	180.8
Current LEP	3,062	8	28	355	2,671	2,228	83.4	438	16.4	5	0.2	176.1
Former LEP	1,383	7	0	1	1,375	920	66.9	448	32.6	7	0.5	189.8
Gender [7]												
Female	49,921	240	60	220	49,401	17,018	34.4	29,663	60.0	2,720	5.5	208.8
Male	52,820	460	93	327	51,940	23,555	45.4	26,928	51.8	1,457	2.8	201.0
Migrant Status												
Migrant	19	0	1	1	17	11	64.7	6	35.3	0	0.0	195.4
Non-Migrant	102,905	720	153	553	101,479	40,670	40.1	56,630	55.8	4,179	4.1	204.7
Ethnicity [8]												
White	56,381	354	51	135	55,841	16,392	29.4	36,657	65.6	2,792	5.0	211.1
Black or African American	17,527	152	43	124	17,208	10,942	63.6	6,122	35.6	144	0.8	189.9
Asian	8,640	62	14	134	8,430	1,700	20.2	5,695	67.6	1,035	12.3	220.0
Pacific Islander	178	2	0	2	174	57	32.8	106	60.9	11	6.3	210.2
Hispanic or Latino	19,374	134	40	150	19,050	11,179	58.7	7,698	40.4	173	0.9	193.1
Amer. Indian/AK Native	106	0	0	0	106	59	55.7	43	40.6	4	3.8	197.3
Other	718	16	6	9	687	352	51.2	315	45.9	20	2.9	197.2
Economic Status												
Econ. Disadvantaged	31,019	249	67	268	30,435	19,433	63.9	10,818	35.5	184	0.6	189.9
Non-Econ. Disadvantaged	71,905	471	87	286	71,061	21,248	29.9	45,818	64.5	3,995	5.6	211.1

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 7.5.8: Descriptive Statistics for Grade 6 LAL Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,606	672	240	548	102,146	43,773	42.9	55,956	54.8	2,417	2.4	201.9
General Education [5]	84,195	0	132	91	83,972	28,798	34.3	52,775	62.8	2,399	2.9	207.5
Special Education	16,827	672	73	112	15,970	13,031	81.6	2,923	18.3	16	0.1	177.0
Limited English Proficient [6]	3,965	14	40	355	3,556	2,945	82.8	608	17.1	3	0.1	173.3
Current LEP	2,781	8	36	353	2,384	2,121	89.0	261	10.9	2	0.1	166.7
Former LEP	1,184	6	4	2	1,172	824	70.3	347	29.6	1	0.1	186.6
Gender [7]												
Female	50,412	246	109	222	49,835	19,150	38.4	29,153	58.5	1,532	3.1	204.9
Male	52,990	410	120	318	52,142	24,490	47.0	26,767	51.3	885	1.7	199.0
Migrant Status												
Migrant	28	0	1	0	27	21	77.8	5	18.5	1	3.7	170.6
Non-Migrant	103,578	672	239	548	102,119	43,752	42.8	55,951	54.8	2,416	2.4	201.9
Ethnicity [8]												
White	57,461	344	71	154	56,892	17,763	31.2	37,531	66.0	1,598	2.8	208.6
Black or African American	17,577	141	80	113	17,243	11,895	69.0	5,296	30.7	52	0.3	186.4
Asian	8,522	38	18	136	8,330	1,794	21.5	5,879	70.6	657	7.9	216.6
Pacific Islander	158	0	0	2	156	62	39.7	91	58.3	3	1.9	203.7
Hispanic or Latino	19,070	129	53	135	18,753	11,818	63.0	6,845	36.5	90	0.5	189.5
Amer. Indian/AK Native	98	1	0	2	95	51	53.7	41	43.2	3	3.2	199.2
Other	720	19	18	6	677	390	57.6	273	40.3	14	2.1	193.1
Economic Status												
Econ. Disadvantaged	30,251	226	102	247	29,676	20,107	67.8	9,474	31.9	95	0.3	186.9
Non-Econ. Disadvantaged	73,355	446	138	301	72,470	23,666	32.7	46,482	64.1	2,322	3.2	208.0

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 7.5.9: Descriptive Statistics for Grade 7 LAL Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

LANGUAGE ARTS LITERACY												
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Performance Data for Students with Valid Scale Scores [3]						
						Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	105,518	651	325	547	103,995	30,843	29.7	57,899	55.7	15,253	14.7	215.4
General Education [5]	85,438	0	187	88	85,163	17,461	20.5	52,691	61.9	15,011	17.6	222.4
Special Education	17,339	651	96	106	16,486	11,574	70.2	4,680	28.4	232	1.4	184.2
Limited English Proficient [6]	3,897	6	44	359	3,488	2,513	72.0	939	26.9	36	1.0	183.1
Current LEP	2,886	3	42	359	2,482	1,936	78.0	536	21.6	10	0.4	177.9
Former LEP	1,011	3	2	0	1,006	577	57.4	403	40.1	26	2.6	195.8
Gender [7]												
Female	51,024	233	141	211	50,439	12,746	25.3	28,627	56.8	9,066	18.0	219.8
Male	54,239	394	171	326	53,348	17,962	33.7	29,204	54.7	6,182	11.6	211.3
Migrant Status												
Migrant	36	0	0	3	33	29	87.9	4	12.1	0	0.0	165.4
Non-Migrant	105,482	651	325	544	103,962	30,814	29.6	57,895	55.7	15,253	14.7	215.4
Ethnicity [8]												
White	58,640	351	89	156	58,044	10,739	18.5	36,315	62.6	10,990	18.9	223.9
Black or African American	18,056	124	120	78	17,734	9,810	55.3	7,327	41.3	597	3.4	194.9
Asian	8,202	34	30	118	8,020	970	12.1	4,332	54.0	2,718	33.9	235.3
Pacific Islander	189	0	1	0	188	28	14.9	131	69.7	29	15.4	223.4
Hispanic or Latino	19,434	113	61	182	19,078	8,874	46.5	9,364	49.1	840	4.4	200.6
Amer. Indian/AK Native	120	0	1	1	118	41	34.7	63	53.4	14	11.9	210.4
Other	877	29	23	12	813	381	46.9	367	45.1	65	8.0	201.8
Economic Status												
Econ. Disadvantaged	30,271	217	146	266	29,642	15,561	52.5	13,114	44.2	967	3.3	196.4
Non-Econ. Disadvantaged	75,247	434	179	281	74,353	15,282	20.6	44,785	60.2	14,286	19.2	223.0

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 7.5.10: Descriptive Statistics for Grade 8 LAL Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

LANGUAGE ARTS LITERACY												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	105,993	636	390	544	104,423	19,749	18.9	72,759	69.7	11,915	11.4	220.0
General Education [5]	85,537	0	213	85	85,239	8,685	10.2	64,804	76.0	11,750	13.8	225.9
Special Education	17,736	636	142	126	16,832	9,401	55.9	7,271	43.2	160	1.0	194.8
Limited English Proficient [6]	3,822	8	37	337	3,440	2,143	62.3	1,279	37.2	18	0.5	192.1
Current LEP	2,864	7	36	337	2,484	1,784	71.8	695	28.0	5	0.2	187.4
Former LEP	958	1	1	0	956	359	37.6	584	61.1	13	1.4	204.2
Gender [7]												
Female	51,355	184	153	242	50,776	6,914	13.6	35,982	70.9	7,880	15.5	225.1
Male	54,407	425	225	297	53,460	12,726	23.8	36,704	68.7	4,030	7.5	215.2
Migrant Status												
Migrant	28	0	2	0	26	19	73.1	7	26.9	0	0.0	190.0
Non-Migrant	105,965	636	388	544	104,397	19,730	18.9	72,752	69.7	11,915	11.4	220.0
Ethnicity [8]												
White	59,267	337	110	144	58,676	5,765	9.8	44,259	75.4	8,652	14.7	226.8
Black or African American	18,536	133	127	110	18,166	6,993	38.5	10,663	58.7	510	2.8	204.8
Asian	8,035	27	22	116	7,870	636	8.1	5,228	66.4	2,006	25.5	233.0
Pacific Islander	158	1	0	0	157	27	17.2	107	68.2	23	14.6	223.5
Hispanic or Latino	18,990	119	96	162	18,613	6,028	32.4	11,913	64.0	672	3.6	208.5
Amer. Indian/AK Native	106	1	0	1	104	23	22.1	72	69.2	9	8.7	218.1
Other	901	18	35	11	837	277	33.1	517	61.8	43	5.1	209.2
Economic Status												
Econ. Disadvantaged	29,500	214	187	242	28,857	10,770	37.3	17,351	60.1	736	2.6	205.3
Non-Econ. Disadvantaged	76,493	422	203	302	75,566	8,979	11.9	55,408	73.3	11,179	14.8	225.6

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 7.5.11: Descriptive Statistics for Grade 5 Mathematics Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	102,924	698	126	177	101,923	23,979	23.5	49,561	48.6	28,383	27.8	225.5
General Education [5]	83,414	0	71	77	83,266	14,267	17.1	42,303	50.8	26,696	32.1	231.7
Special Education	16,703	698	51	89	15,865	8,173	51.5	6,241	39.3	1,451	9.1	198.5
Limited English Proficient [6]	4,445	15	6	11	4,413	2,207	50.0	1,776	40.2	430	9.7	199.9
Current LEP	3,062	8	5	11	3,038	1,722	56.7	1,075	35.4	241	7.9	194.5
Former LEP	1,383	7	1	0	1,375	485	35.3	701	51.0	189	13.7	211.9
Gender [7]												
Female	49,921	242	54	59	49,566	11,494	23.2	24,981	50.4	13,091	26.4	225.1
Male	52,820	436	72	117	52,195	12,408	23.8	24,504	46.9	15,283	29.3	226.0
Migrant Status												
Migrant	19	0	0	0	19	6	31.6	12	63.2	1	5.3	210.3
Non-Migrant	102,905	698	126	177	101,904	23,973	23.5	49,549	48.6	28,382	27.9	225.5
Ethnicity [8]												
White	56,381	346	46	55	55,934	8,471	15.1	28,805	51.5	18,658	33.4	233.0
Black or African American	17,527	145	39	72	17,271	7,913	45.8	7,679	44.5	1,679	9.7	203.2
Asian	8,640	60	7	5	8,568	646	7.5	3,004	35.1	4,918	57.4	251.9
Pacific Islander	178	2	0	0	176	31	17.6	81	46.0	64	36.4	233.8
Hispanic or Latino	19,374	129	30	43	19,172	6,643	34.6	9,627	50.2	2,902	15.1	212.3
Amer. Indian/AK Native	106	0	0	0	106	34	32.1	53	50.0	19	17.9	216.4
Other	718	16	4	2	696	241	34.6	312	44.8	143	20.5	214.3
Economic Status												
Econ. Disadvantaged	31,019	235	59	97	30,628	12,434	40.6	14,419	47.1	3,775	12.3	207.6
Non-Econ. Disadvantaged	71,905	463	67	80	71,295	11,545	16.2	35,142	49.3	24,608	34.5	233.2

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 7.5.12: Descriptive Statistics for Grade 6 Mathematics Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	103,606	631	224	180	102,571	28,709	28.0	53,298	52.0	20,564	20.0	219.0
General Education [5]	84,195	0	122	67	84,006	16,931	20.2	47,343	56.4	19,732	23.5	225.5
Special Education	16,827	631	93	111	15,992	10,147	63.5	5,156	32.2	689	4.3	189.4
Limited English Proficient [6]	3,965	13	15	6	3,931	2,300	58.5	1,380	35.1	251	6.4	193.7
Current LEP	2,781	8	11	4	2,758	1,794	65.0	819	29.7	145	5.3	188.8
Former LEP	1,184	5	4	2	1,173	506	43.1	561	47.8	106	9.0	205.3
Gender [7]												
Female	50,412	240	91	69	50,012	13,659	27.3	27,021	54.0	9,332	18.7	218.6
Male	52,990	376	128	109	52,377	14,935	28.5	26,221	50.1	11,221	21.4	219.5
Migrant Status												
Migrant	28	0	0	0	28	20	71.4	5	17.9	3	10.7	192.0
Non-Migrant	103,578	631	224	180	102,543	28,689	28.0	53,293	52.0	20,561	20.1	219.0
Ethnicity [8]												
White	57,461	316	74	81	56,990	10,228	17.9	32,794	57.5	13,968	24.5	226.9
Black or African American	17,577	130	93	57	17,297	9,213	53.3	7,174	41.5	910	5.3	196.7
Asian	8,522	36	6	10	8,470	831	9.8	3,684	43.5	3,955	46.7	244.2
Pacific Islander	158	0	0	0	158	29	18.4	88	55.7	41	25.9	225.8
Hispanic or Latino	19,070	129	48	31	18,862	8,085	42.9	9,190	48.7	1,587	8.4	204.6
Amer. Indian/AK Native	98	1	0	0	97	34	35.1	49	50.5	14	14.4	213.0
Other	720	19	3	1	697	289	41.5	319	45.8	89	12.8	207.7
Economic Status												
Econ. Disadvantaged	30,251	206	114	86	29,845	14,275	47.8	13,442	45.0	2,128	7.1	201.0
Non-Econ. Disadvantaged	73,355	425	110	94	72,726	14,434	19.8	39,856	54.8	18,436	25.3	226.4

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 7.5.13: Descriptive Statistics for Grade 7 Mathematics Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

MATHEMATICS												
						Performance Data for Students with Valid Scale Scores [3]						
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	105,518	640	306	179	104,393	37,313	35.7	46,413	44.5	20,667	19.8	213.3
General Education [5]	85,438	0	183	76	85,179	23,168	27.2	42,018	49.3	19,993	23.5	221.3
Special Education	17,339	640	110	94	16,495	12,269	74.4	3,690	22.4	536	3.2	177.2
Limited English Proficient [6]	3,897	4	14	10	3,869	2,533	65.5	1,097	28.4	239	6.2	185.2
Current LEP	2,886	2	13	9	2,862	2,005	70.1	718	25.1	139	4.9	180.5
Former LEP	1,011	2	1	1	1,007	528	52.4	379	37.6	100	9.9	198.7
Gender [7]												
Female	51,024	230	130	65	50,599	17,747	35.1	23,375	46.2	9,477	18.7	213.5
Male	54,239	385	170	113	53,571	19,396	36.2	22,996	42.9	11,179	20.9	213.3
Migrant Status												
Migrant	36	0	0	0	36	27	75.0	9	25.0	0	0.0	170.2
Non-Migrant	105,482	640	306	179	104,357	37,286	35.7	46,404	44.5	20,667	19.8	213.3
Ethnicity [8]												
White	58,640	347	95	84	58,114	14,608	25.1	29,255	50.3	14,251	24.5	222.5
Black or African American	18,056	119	114	51	17,772	11,381	64.0	5,515	31.0	876	4.9	186.9
Asian	8,202	34	13	3	8,152	1,088	13.3	3,214	39.4	3,850	47.2	243.0
Pacific Islander	189	0	1	0	188	38	20.2	99	52.7	51	27.1	224.1
Hispanic or Latino	19,434	111	64	38	19,221	9,706	50.5	7,986	41.5	1,529	8.0	198.2
Amer. Indian/AK Native	120	0	2	0	118	43	36.4	52	44.1	23	19.5	210.8
Other	877	29	17	3	828	449	54.2	292	35.3	87	10.5	195.4
Economic Status												
Econ. Disadvantaged	30,271	215	140	87	29,829	16,989	57.0	10,905	36.6	1,935	6.5	192.8
Non-Econ. Disadvantaged	75,247	425	166	92	74,564	20,324	27.3	35,508	47.6	18,732	25.1	221.5

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 7.5.14: Descriptive Statistics for Grade 8 Mathematics Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

MATHEMATICS												
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Performance Data for Students with Valid Scale Scores [3]						
						Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	105,993	640	543	246	104,564	34,127	32.6	44,553	42.6	25,884	24.8	217.2
General Education [5]	85,537	0	313	101	85,123	19,906	23.4	40,231	47.3	24,986	29.4	226.8
Special Education	17,736	640	219	139	16,738	12,230	73.1	3,763	22.5	745	4.5	175.3
Limited English Proficient [6]	3,822	7	15	8	3,792	2,621	69.1	912	24.1	259	6.8	180.3
Current LEP	2,864	6	12	7	2,839	2,113	74.4	572	20.1	154	5.4	174.7
Former LEP	958	1	3	1	953	508	53.3	340	35.7	105	11.0	196.9
Gender [7]												
Female	51,355	192	208	99	50,856	16,620	32.7	22,857	44.9	11,379	22.4	216.3
Male	54,407	420	322	147	53,518	17,369	32.5	21,653	40.5	14,496	27.1	218.2
Migrant Status												
Migrant	28	0	2	0	26	19	73.1	6	23.1	1	3.8	181.5
Non-Migrant	105,965	640	541	246	104,538	34,108	32.6	44,547	42.6	25,883	24.8	217.2
Ethnicity [8]												
White	59,267	342	171	104	58,650	12,138	20.7	28,078	47.9	18,434	31.4	228.8
Black or African American	18,536	128	189	81	18,138	11,269	62.1	5,754	31.7	1,115	6.1	186.7
Asian	8,035	27	11	7	7,990	931	11.7	2,912	36.4	4,147	51.9	247.9
Pacific Islander	158	1	0	0	157	38	24.2	70	44.6	49	31.2	228.0
Hispanic or Latino	18,990	124	144	49	18,673	9,276	49.7	7,398	39.6	1,999	10.7	198.2
Amer. Indian/AK Native	106	1	2	1	102	38	37.3	44	43.1	20	19.6	209.8
Other	901	17	26	4	854	437	51.2	297	34.8	120	14.1	196.9
Economic Status												
Econ. Disadvantaged	29,500	221	267	108	28,904	16,060	55.6	10,200	35.3	2,644	9.1	193.1
Non-Econ. Disadvantaged	76,493	419	276	138	75,660	18,067	23.9	34,353	45.4	23,240	30.7	226.4

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Table 7.5.15: Descriptive Statistics for Grade 8 Science Scale Scores and Percentage Distributions of Students' Performance Levels by Demographic Groups – 2008 NJ ASK Operational Forms

SCIENCE												
Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Performance Data for Students with Valid Scale Scores [3]						
						Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	105,993	567	742	226	104,458	16,686	16.0	54,126	51.8	33,646	32.2	232.6
General Education [5]	85,537	0	419	93	85,025	8,014	9.4	44,810	52.7	32,201	37.9	238.9
Special Education	17,736	567	296	121	16,752	7,104	42.4	8,301	49.6	1,347	8.0	206.4
Limited English Proficient [6]	3,822	8	37	15	3,762	1,985	52.8	1,586	42.2	191	5.1	200.0
Current LEP	2,864	6	29	13	2,816	1,673	59.4	1,045	37.1	98	3.5	196.0
Former LEP	958	2	8	2	946	312	33.0	541	57.2	93	9.8	212.1
Gender [7]												
Female	51,355	171	291	81	50,812	7,994	15.7	27,926	55.0	14,892	29.3	231.1
Male	54,407	371	437	144	53,455	8,607	16.1	26,108	48.8	18,740	35.1	234.2
Migrant Status												
Migrant	28	0	2	0	26	13	50.0	12	46.2	1	3.8	201.5
Non-Migrant	105,965	567	740	226	104,432	16,673	16.0	54,114	51.8	33,645	32.2	232.6
Ethnicity [8]												
White	59,267	303	213	98	58,653	4,236	7.2	29,891	51.0	24,526	41.8	242.2
Black or African American	18,536	110	287	64	18,075	6,227	34.5	10,026	55.5	1,822	10.1	211.1
Asian	8,035	27	22	4	7,982	520	6.5	3,069	38.4	4,393	55.0	250.9
Pacific Islander	158	1	0	0	157	12	7.6	86	54.8	59	37.6	239.5
Hispanic or Latino	18,990	109	186	55	18,640	5,440	29.2	10,570	56.7	2,630	14.1	216.2
Amer. Indian/AK Native	106	1	1	1	103	21	20.4	51	49.5	31	30.1	230.4
Other	901	16	33	4	848	230	27.1	433	51.1	185	21.8	220.7
Economic Status												
Econ. Disadvantaged	29,500	187	374	100	28,839	9,480	32.9	16,063	55.7	3,296	11.4	212.9
Non-Econ. Disadvantaged	76,493	380	368	126	75,619	7,206	9.5	38,063	50.3	30,350	40.1	240.2

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

Scale Score Distributions by District Factor Groups (DFG)

New Jersey has an established history of applying District Factor Groups (DFGs)[4] in the analysis and reporting of assessment results. DFG is an indicator of the socioeconomic status of citizens in each district and has been useful for the comparative reporting of test results from New Jersey's statewide testing programs. The measure was first developed in 1974 using demographic variables from the 1970 United States Census. A revision was made in 1984 to take into account new data from the 1980 United States Census. The DFG designations were updated again in 1992 after the 1990 census. The current DFG designations are based upon the 2000 census. The DFGs are labeled from A (lowest) to J (highest). Additional DFGs are designated for special groups that are not defined geographically (e.g., charter schools).

Descriptive statistics of scale scores and percentage distributions of student performance by DFG for General Education group are summarized in Tables 7.5.16 through 7.5.18 by content area and grade. For each of the content areas, students who were flagged as "void" or "not present" were removed. Results are slightly different from the Cycle II reports. These descriptive statistics are based on data collected prior to record changes, automatic rescore, and Cycle I reporting. For an in-depth analysis of student performance by DFG, please see the Cycle II reports at: http://www.nj.gov/education/schools/achievement/2009/njask58/g8/demographic_reports.pdf

Table 7.5.16: Descriptive Statistics for LAL Scale Scores and Percentage Distributions of Students' Performance Levels by DFG

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
5	A	16245	187.60	25.37	100	300	66.90	32.49	0.61
	B	10040	194.82	25.11	100	297	55.85	42.99	1.17
	CD	9424	200.12	24.10	119	281	47.03	51.14	1.84
	DE	13047	205.07	24.31	100	300	39.33	57.55	3.12
	FG	12604	207.67	24.03	100	300	34.62	61.85	3.52
	GH	13810	211.87	25.06	100	300	28.86	65.06	6.08
	I	19531	216.56	24.40	100	300	22.11	69.77	8.12
	J	4504	222.72	22.85	127	300	14.45	74.62	10.92
	N	384	194.29	23.40	127	256	55.99	42.71	1.30
	O	15	165.00	24.00	136	211	86.67	13.33	0.00
	R	1750	192.78	24.87	110	300	59.66	39.37	0.97
6	A	15738	183.52	25.40	100	282	72.44	27.31	0.25
	B	9984	192.78	24.42	100	287	58.10	41.26	0.64
	CD	9642	197.37	23.61	100	299	51.50	47.52	0.97
	DE	13296	202.36	22.78	100	289	42.55	55.80	1.65
	FG	12672	204.58	22.38	100	300	38.08	60.24	1.68
	GH	14221	209.61	23.60	100	300	30.62	65.38	4.01
	I	19909	213.52	22.18	100	300	23.60	71.69	4.71
	J	4409	218.17	20.85	103	300	16.31	77.66	6.03
	N	363	190.45	21.10	133	236	62.26	37.74	0.00
	O	27	160.19	25.95	121	237	96.30	3.70	0.00

[4] For more information on DFGs, see the following link: http://www.state.nj.us/education/finance/sf/dfg.pdf

	R	1766	191.14	23.64	109	267	63.42	35.79	0.79
	V	15	204.20	11.60	187	225	40.00	60.00	0.00
7	A	16176	192.14	28.87	100	300	58.75	38.85	2.40
	B	10390	204.60	29.65	100	300	41.78	51.81	6.41
	CD	9940	210.45	30.08	100	300	34.28	56.36	9.37
	DE	16097	216.39	28.94	100	300	25.85	61.62	12.53
	FG	14345	219.07	29.56	100	300	23.67	61.48	14.84
	GH	13663	223.51	29.96	100	300	19.75	60.90	19.34
	I	19962	231.16	29.18	100	300	13.08	60.35	26.57
	J	4253	237.67	28.99	100	300	8.21	56.74	35.06
	N	365	192.20	29.36	112	288	61.10	35.62	3.29
	O	66	160.33	24.62	112	208	87.88	12.12	0.00
	R	1672	201.70	29.29	121	300	48.21	45.75	6.04
	V	12	219.50	24.59	176	274	8.33	83.33	8.33

Table 7.5.16 (continued): Descriptive Statistics for LAL Scale Scores and Percentage Distributions of Students' Performance Levels by DFG

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
8	A	16709	202.02	24.54	100	299	43.31	54.39	2.30
	B	11279	211.34	23.32	100	300	27.51	68.28	4.21
	CD	9967	216.60	23.65	100	300	21.19	71.15	7.66
	DE	13570	220.21	22.25	100	300	15.70	75.30	9.01
	FG	13957	222.25	22.87	100	300	14.27	74.91	10.82
	GH	13773	227.67	23.26	100	300	10.28	72.76	16.96
	I	20003	231.52	21.66	100	300	6.58	73.42	20.00
	J	4346	236.27	22.06	100	300	4.58	68.18	27.24
	N	357	200.06	23.31	129	250	48.18	51.54	0.28
	O	104	181.15	24.75	125	233	73.08	26.92	0.00
	R	1517	209.85	22.62	136	293	31.38	64.67	3.96
	V	20	231.40	17.16	206	270	85.00	15.00	0.00

Table 7.5.17: Mathematics - Descriptive Statistics for Scale Scores and Percentage Distributions of Students' Performance Levels by DFG

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
5	A	16355	205.79	35.97	100	300	43.30	44.20	12.50
	B	10121	213.80	34.98	100	300	33.81	49.50	16.69
	CD	9458	218.51	34.01	100	300	28.33	52.06	19.61
	DE	13071	226.97	34.77	109	300	20.84	51.58	27.58
	FG	12646	227.50	34.13	100	300	20.01	52.04	27.95
	GH	13858	233.67	35.07	100	300	16.08	49.00	34.93
	I	19579	240.39	33.89	100	300	11.34	46.49	42.17
	J	4527	246.75	32.17	100	300	7.05	43.23	49.72
	N	385	216.86	31.22	125	300	25.97	59.22	14.81
	O	15	168.73	37.83	125	254	80.00	13.33	6.67
	R	1752	207.50	35.39	117	300	42.75	44.52	12.73
6	A	15823	198.022	32.513	100	300	52.40	40.79	6.81
	B	10050	208.022	32.135	100	300	39.03	50.43	10.54
	CD	9697	212.232	32.062	100	300	33.34	54.09	12.57
	DE	13321	218.077	32.291	100	300	27.72	54.76	17.53
	FG	12708	220.982	32.481	100	300	23.49	57.01	19.50
	GH	14257	226.955	33.535	100	300	19.44	54.50	26.06
	I	19964	234.425	33.071	118	300	13.36	53.67	32.97
	J	4434	242.575	32.311	108	300	7.67	50.16	42.17
	N	363	210.667	27.531	133	300	30.03	60.33	9.64
	O	27	161.000	29.009	118	246	92.59	7.41	0.00
	R	1768	203.668	33.776	118	300	47.62	42.53	9.84
	V	15	240.133	22.941	205	292	0.00	60.00	40.00

Table 7.5.17 (continued): Mathematics - Descriptive Statistics for Scale Scores and Percentage Distributions of Students' Performance Levels by DFG

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
7	A	16254	189.26	36.35	100	300	61.11	32.79	6.10
	B	10432	202.03	36.70	100	300	47.23	41.93	10.84
	CD	9946	207.74	36.88	100	300	40.82	45.20	13.98
	DE	12793	213.68	37.90	100	300	34.68	46.81	18.50
	FG	13994	215.47	36.52	100	300	31.71	49.19	19.09
	GH	13705	223.19	38.34	100	300	25.82	47.44	26.74
	I	19809	229.98	37.42	100	300	19.76	48.39	31.85
	J	4228	240.27	36.08	123	300	12.58	44.39	43.02
	N	368	190.76	34.74	109	300	60.33	32.61	7.07
	O	60	152.98	28.26	100	271	96.67	1.67	1.67
	R	1660	193.32	38.22	100	300	58.07	33.07	8.86
8	A	16347	187.77	41.05	100	300	61.29	30.64	8.07
	B	10296	203.55	41.92	100	300	45.01	40.52	14.47
	CD	9897	211.52	41.08	100	300	36.67	44.43	18.90
	DE	13572	217.53	40.10	100	300	30.77	47.38	21.85
	FG	13836	221.52	40.02	100	300	26.91	47.86	25.23
	GH	13794	228.83	41.04	100	300	21.94	45.43	32.64
	I	19980	236.10	40.14	100	300	16.55	44.47	38.98
	J	4342	247.62	38.36	100	300	9.79	39.34	50.88
	N	357	184.38	37.82	101	300	65.83	30.81	3.36
	O	98	147.17	32.72	100	276	91.84	7.14	1.02
	R	1508	197.44	40.78	100	300	52.85	35.54	11.60
	V	20	246.90	31.15	165	300	5.00	40.00	55.00

Table 7.5.18: Science - Descriptive Statistics for Scale Scores and Percentage Distributions of Students' Performance Levels by DFG

Grade	DFG	N	Mean	StdDev	Min	Max	%PP	%P	%AP
8	A	16456	208.46	28.08	100	300	39.28	51.84	8.88
	B	10809	221.14	29.95	104	300	23.80	57.62	18.58
	CD	9925	227.64	30.26	100	300	17.50	57.96	24.53
	DE	13550	233.17	29.52	104	300	12.21	57.58	30.21
	FG	13834	237.69	29.76	100	300	9.95	53.51	36.55
	GH	13789	240.86	30.62	100	300	8.99	50.29	40.71
	I	19987	248.20	29.69	100	300	5.25	44.41	50.34
	J	4349	255.95	28.51	150	300	3.29	35.11	61.60
	N	355	208.65	26.97	150	300	39.44	52.39	8.17
	O	99	187.58	23.24	137	293	72.73	25.25	2.02
	R	1507	219.77	30.26	144	300	25.08	57.27	17.65
	V	20	233.10	21.51	187	287	5.00	70.00	25.00

PART 8: SCALING AND EQUATING

This section details the equating, scaling, and linking procedures applied to the operational tests. Scaling and linking procedures were applied to the 2008 NJ ASK 5-8 Language Arts Literacy (LAL) and Mathematics assessments. Scaling and equating procedures were applied to the 2008 NJ ASK Grade 8 Science assessment.

The 2008 NJ ASK operational tests in LAL and mathematics differ from the 2007 NJ ASK operational tests as follows:

- more reading passages
- more diverse content
- shorter reading passage lengths
- more test items overall
- more score points overall
- two days of testing for grades 5-7 in mathematics (only one day for grade 8)
- more constructed response items in mathematics
- new item type in mathematics –short constructed response.

Due to these changes in the operational tests, a Standard Setting meeting was held in June of 2008 to establish new standards for designating test performance as Partially Proficient, Proficient, and Advance Proficient. With the implementation of the new standards and new test design, the 2008 operational scores in LAL and mathematics have been established as the new "base" year. Consequently, the 2008 NJ ASK 5-8 in LAL and mathematics were not equated to the 2007 NJ ASK 5-7 and GEPA.

The 2008 NJ ASK Grade 8 Science operational test did not change and was equated to the 2007 Grade Eight Proficiency Assessment (GEPA) operational test scores following the scaling and equating plan approved by the NJ DOE. Although the 2008 NJ ASK LAL and mathematics operational scores were not equated to the 2007 NJ ASK operational tests, links to the 2007 scores were required in order to fulfill the No Child Left Behind (NCLB) Adequate Yearly Progress (AYP) requirements.

To accomplish the required scaling, linking, and/or equating, the 2008 operational tests were calibrated with WINSTEPS (Linacre, 2006[5]). WINSTEPS is designed to produce a single scale by jointly analyzing data resulting from students' responses to both MC and CR items. MC items were calibrated using the Rasch model (Rasch, 1960[6], Wright & Stone, 1979[7]; Anderich, 1978[8]), while the partial credit model (Masters, 1982[9]) was used for CR items.

Rasch scaling is "a method for obtaining objective, fundamental, linear measures from stochastic observations of ordered category responses" (Linacre, 2006, p.10). In the Rasch model, the probability of a correct response to item *i* given θ is:

[5] Linacre, J. M. (2006). A *User's Guide to WINSTEPS MINISTEP Rasch-Model Computer Programs*. Chicago
[6] Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Copenhagen: Danish Institute for Educational Research.
[7] Wright, B. D., & Stone, M. H. (1979). *Best test design*. Chicago: MESA Press.
[8] Anderich, D. (1978). A rating formulation for ordered response categories. *Psychometrika,* 43, 561-573.
[9] Masters, G. N. (1982). A Rasch model for partial credit scoring. *Psychometrika*, *47*, 149-174.

$$P_i(\theta) = \frac{e^{(\theta - b_i)}}{1 + e^{(\theta - b_i)}}$$

where θ = latent trait or ability level,
b_i = the difficulty parameter for item i.

Similar to other IRT models (Hambleton, 1989[10]; Hambleton & Swaminathan, 1985[11]), the Rasch model requires an assumption of unidimensionality. (Smith, Jr., 2004[12]). Unidimensionality means that all items measure a single construct. If the data fit the model, the measurement units (logits) have the desirable property of maintaining the same size over the whole continuum. These interval measures may then be used in subsequent statistical analyses that assume an interval scale (Smith, Jr., 2004). Also, like other IRT models, the Rasch model allows for separability of parameter estimates (Hambleton, Swaminathan, & Rogers, 1991[13]; van der Linden & Hambleton, 1997[14]). That is, the ability estimates of persons are freed from the distributional properties of the specific items attempted. Likewise, the estimated difficulties of items are freed from the distributional properties of specific examinees used in the calibration. This property was useful for the Braille and Large Print test score scaling described below in Section 8.2.

To equate the 2008 NJ ASK Science Grade 8 operational test and to link the 2008 NJ ASK 5-8 LAL and mathematics operational tests to the 2007 tests, anchored calibrations were conducted for each content area and grade level. Following the recommendation of the New Jersey Technical Advisory Committee (TAC), the equating was accomplished in two steps. First, the 2008 science test scores were equated to the 2007 "base" scale through anchored calibrations. Next, the equated Rasch measures were re-centered to the 2007 "reported" scale.

[10] Hambleton, R. K (1989). Principles and selected applications of item response theory. In R. L. Linn (Ed.), *Educational Measurement* (3rd ed.). Washington, DC: American Council on Education.
[11] Hambleton, R. K., & Swaminathan, H. (1985). *Item Response Theory. Principles and Applications*. Boston: Kluwer.
[12] Smith, Jr. E. V. (2004). Evidence for the reliability of measures and validity of measure interpretation: A Rasch measurement perspective. In E. V. Smith, Jr. & R. M. Smith, Introduction to Rasch measurement: Theory, models and applications. Maple Grove, MN: JAM Press.
[13] Hambleton, R. K., Swaminathan, H. & Rogers, H. J. (1991). Fundamentals of Items Response Theory. Newbury Park, CA: Sage Publications.
[14] van der Linden, W. J. & Hambleton, R. K. (1997). Handbook of Modern Item Response Theory. New York: Springer-verlagVerlag.

8.1. Scaling and Equating Data

Sample Size and Distributions

The 2008 NJ ASK scaling, equating, and linking data comprised about 35% of the total student population in LAL and 100% of the student population in mathematics and science. At the time the scaling and equating analyses were conducted for 2008 NJ ASK a total of 145,374 student records in LAL, 415,918 student records in mathematics, and 106,343 student records in science where available. The 2008 NJ ASK scaling and equating samples are summarized in Table 8.1.1. Generally, less than 1% of the records was invalid and removed from analyses.

Table 8.1.1: N-Counts for the 2008 NJ ASK Scaling and Equating Samples by Test and Grade

Test	Total	Valid	Invalid
LAL 5	35831	35472	359
LAL 6	34442	34080	362
LAL 7	35859	35093	766
LAL 8	39242	38539	703
LALS 5	576	500	76
LALS 6	676	655	21
LALS 7	756	670	86
LALS 8	699	665	34
Math 5	102797	101767	1030
Math 6	103511	102427	1084
Math 7	105394	103261	2133
Math 8	105945	104047	1898
Science 8	106343	104680	1663

The sample data used for the 2008 scaling and linking/equating was representative of the total student population in terms of DFG and other demographic variables such as gender, ethnicity, economic status, and Current Limited English Proficiency (CLEP). A comparison between data from the 2008 form distribution plan and the sample data used for scaling and linking/equating is presented in Tables 8.1.2 to 8.1.5. These tables show the difference between the 2008 form distribution plan and the equating/linking sample to be no more than 2.74% for any DFG group across all tests.

Tables 8.1.6 through 8.1.8 present the N-counts for the 2008 scaling and equating/linking samples by DFG, gender, and ethnicity. Note that the sum for males and females will not equal the total in Table 8.1.1 because some students had a missing value for gender. Similarly, some students had a missing value for ethnicity or marked multiple ethnicities, therefore the sum over ethnic groups will not equal the total number of students. Also reported in Tables 8.1.6 through 8.1.8 are the numbers of economically disadvantaged students as well as CLEP students.

Table 8.1.2: Comparison of the 2008 NJ ASK Linking Sample and the Statewide DFG Distribution for Grade 5

DFG	Statewide Distribution	LAL		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	15.96	16.37	0.41	16.07	0.11
B	10.06	8.3	-1.76	9.95	-0.11
CD	9.21	9.03	-0.18	9.29	0.08
DE	12.62	15.36	2.74*	12.84	0.22
FG	12.3	10.7	-1.6	12.43	0.13
GH	13.2	15.47	2.27	13.62	0.42
I	18.36	20.28	1.92	19.24	0.88
J	4.2	3.71	-0.49	4.45	0.25
N	0.41	0.48	0.07	0.38	-0.03
O	1.26	0.00	-1.26	0.01	-1.25*
R	1.97	0.31	-1.66	1.72	-0.25
S	0.41	0.00	-0.41	0.00	-0.41
V	0.03	0.00	-0.03	0.00	-0.03

*Indicates the maximum difference between statewide distribution and the sample.

Table 8.1.3: Comparison of the 2008 NJ ASK Equating Sample and the Statewide DFG Distribution for Grade 6

DFG	Statewide Distribution	LAL		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	15.37	16.39	1.02	15.45	0.08
B	9.64	7.76	-1.88*	9.81	0.17
CD	9.32	9.08	-0.24	9.47	0.15
DE	13.12	13.97	0.85	13.01	-0.11
FG	12.39	12.19	-0.2	12.41	0.02
GH	13.35	14.97	1.62	13.92	0.57
I	18.37	19.61	1.24	19.49	1.12
J	4.1	5.12	1.02	4.33	0.23
N	0.41	0.72	0.31	0.35	-0.06
O	1.41	0.00	-1.41	0.03	-1.38*
R	1.98	0.18	-1.8	1.73	-0.25
S	0.48	0.00	-0.48	0.00	-0.48
V	0.06	0.00	-0.06	0.01	-0.05

*Indicates the maximum difference between statewide distribution and the sample.

Table 8.1.4: Comparison of the 2008 NJ ASK Equating Sample and the Statewide DFG Distribution for Grade 7

DFG	Statewide Distribution	LAL		Math	
		Obs(%)	Diff	Obs(%)	Diff
A	15.17	14.83	-0.34	15.74	0.57
B	10.16	12.34	2.18*	10.10	-0.06
CD	9.32	9.45	0.13	9.63	0.31
DE	12.65	13.86	1.21	12.39	-0.26
FG	13.07	13.68	0.61	13.55	0.48
GH	13.07	12.29	-0.78	13.27	0.20
I	18.18	18.74	0.56	19.18	1.00
J	3.87	3.68	-0.19	4.09	0.22
N	0.37	0.84	0.47	0.36	-0.01
O	1.65	0.00	-1.65	0.06	-1.59*
R	1.93	0.25	-1.68	1.61	-0.32
S	0.49	0.00	-0.49	0.00	-0.49
V	0.06	0.03	-0.03	0.01	-0.05

*Indicates the maximum difference between statewide distribution and the sample.

Table 8.1.5: Comparison of the 2008 NJ ASK Equating Sample and the Statewide DFG Distribution for Grade 8

DFG	Statewide Distribution	LAL		Math		Science	
		Obs(%)	Diff	Obs(%)	Diff	Obs(%)	Diff
A	15.25	15.94	0.69	15.71	0.46	15.72	0.47
B	9.94	10.96	1.02	9.9	-0.04	10.33	0.39
CD	9.5	10.62	1.12	9.51	0.01	9.48	-0.02
DE	12.8	13.07	0.27	13.04	0.24	12.94	0.14
FG	12.69	12.97	0.28	13.3	0.61	13.22	0.53
GH	13.24	12.8	-0.44	13.26	0.02	13.17	-0.07
I	17.93	18.35	0.42	19.2	1.27	19.09	1.16
J	3.91	4.35	0.44	4.17	0.26	4.15	0.24
N	0.36	0.72	0.36	0.34	-0.02	0.34	-0.02
O	2.06	0.01	-2.05*	0.09	-1.97*	0.09	-1.97*
R	1.75	0.20	-1.55	1.45	-0.3	1.44	-0.31
S	0.52	0.00	-0.52	0.00	-0.52	0.00	-0.52
V	0.06	0.01	-0.05	0.02	-0.04	0.02	-0.04

*Indicates the maximum difference between statewide distribution and the sample.

Table 8.1.6: Equating\Linking Sample N-Counts by Gender and Ethnicity: LAL

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP
LAL 5	A	2925	2881	98	2123	3188	5	0	397	4736	816
	B	1487	1457	177	859	1199	4	8	709	2026	240
	CD	1630	1574	191	555	689	3	7	1769	1188	83
	DE	2818	2630	318	853	390	6	10	3887	1128	62
	FG	1942	1854	341	435	609	2	24	2411	750	79
	GH	2823	2663	942	782	169	6	4	3593	613	77
	I	3683	3510	699	545	364	7	7	5585	401	60
	J	676	639	215	22	40	0	3	1038	19	6
	N	78	93	0	52	93	0	0	26	117	7
	R	55	54	5	56	31	0	0	17	59	0
	Total	**17355**	**18117**	**2986**	**6282**	**6772**	**33**	**63**	**19432**	**11037**	**1430**
LAL 6	A	2839	2748	93	2138	2946	4	2	410	4467	697
	B	1367	1278	141	669	1133	4	12	702	1679	146
	CD	1597	1496	141	508	592	7	6	1852	1071	54
	DE	2455	2306	441	624	214	3	7	3482	961	38
	FG	2082	2074	343	440	616	4	16	2757	811	46
	GH	2586	2515	654	893	567	5	5	2987	750	87
	I	3449	3235	708	405	318	7	4	5253	364	43
	J	854	892	267	28	41	0	0	1410	14	11
	N	118	126	0	89	132	0	1	23	172	21
	O	1	0	0	0	1	0	0	0	1	0
	R	30	32	0	37	15	0	0	10	33	0
	Total	**17378**	**16702**	**2788**	**5831**	**6575**	**34**	**53**	**18886**	**10323**	**1143**
LAL 7	A	2624	2579	108	2116	2418	5	1	561	4095	564
	B	2189	2143	279	1089	1547	6	16	1417	2619	221
	CD	1712	1605	220	651	863	7	6	1583	1282	123
	DE	2458	2407	304	608	533	2	7	3420	968	42
	FG	2458	2343	394	466	641	4	16	3300	780	52
	GH	2204	2109	513	522	420	5	8	2858	525	69
	I	3322	3256	704	461	353	10	5	5060	327	34
	J	670	621	208	16	29	1	3	1038	12	5
	N	140	155	0	101	156	0	1	38	156	9
	R	41	46	9	34	33	0	0	11	38	0
	V	6	5	5	2	3	0	1	1	5	0
	Total	**17824**	**17269**	**2744**	**6066**	**6996**	**40**	**64**	**19287**	**10807**	**1119**

Table 8.1.6 (continued): Equating\Linking Sample N-Counts by Gender and Ethnicity: LAL

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP
LAL 8	A	3085	3060	127	2453	3070	5	0	495	4853	681
	B	2178	2044	370	1124	1612	3	10	1116	2620	267
	CD	2085	2009	255	676	933	3	4	2230	1430	112
	DE	2562	2475	335	633	496	5	6	3573	1045	69
	FG	2511	2488	389	505	591	3	14	3514	808	64
	GH	2495	2438	308	601	438	7	3	3586	558	53
	I	3595	3475	761	565	390	8	8	5354	394	61
	J	856	820	268	28	53	1	2	1327	14	18
	N	145	134	0	113	134	0	3	32	150	10
	O	2	1	1	1	1	0	0	0	3	0
	R	28	48	0	62	14	0	1	0	62	0
	V	0	5	2	0	2	0	0	1	1	0
	Total	**19542**	**18997**	**2816**	**6761**	**7734**	**35**	**51**	**21228**	**11938**	**1335**

Table 8.1.7: Equating\Linking Sample N-Counts by Gender and Ethnicity: Mathematics

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP
Math 5	A	8268	7964	274	6434	8038	13	2	1511	12931	2259
	B	5237	4795	618	2342	3287	11	21	3773	5606	662
	CD	4772	4625	609	1785	1982	11	21	4998	3350	295
	DE	6716	6254	826	1821	1740	18	24	8546	2888	256
	FG	6495	6107	1030	1070	1298	8	67	9135	1852	256
	GH	7060	6620	1876	1332	1220	21	11	9231	1519	283
	I	9957	9525	2367	1061	867	20	18	15161	790	242
	J	2288	2201	910	108	146	2	7	3321	57	64
	N	178	206	5	105	216	0	2	56	252	49
	O	6	9	0	8	0	0	0	7	10	0
	R	817	873	46	1143	348	2	3	152	1153	9
	Total	**51794**	**49179**	**8561**	**17209**	**19142**	**106**	**176**	**55891**	**30408**	**4375**

Table 8.1.7 (continued): Equating\Linking Sample N-Counts by Gender and Ethnicity: Mathematics

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP
Math 6	A	8100	7522	237	6180	7756	12	6	1486	12112	2008
	B	5180	4794	575	2295	3231	13	30	3852	5435	587
	CD	4910	4661	626	1899	1918	17	22	5097	3410	285
	DE	6775	6452	862	1868	1727	11	18	8750	2962	215
	FG	6446	6221	1005	1032	1320	10	49	9256	1878	202
	GH	7206	6908	1887	1507	1217	14	13	9489	1505	262
	I	10113	9749	2430	1096	880	18	16	15428	818	210
	J	2292	2130	787	101	133	0	1	3401	68	64
	N	170	192	1	119	193	1	2	46	236	42
	O	16	11	0	16	5	0	0	6	19	1
	R	763	989	48	1132	445	1	1	128	1193	10
	V	8	7	6	4	4	0	0	1	6	0
	Total	**51979**	**49636**	**8464**	**17249**	**18829**	**97**	**158**	**56940**	**29642**	**3886**
Math 7	A	8186	7856	243	6422	7809	15	2	1609	12272	1933
	B	5267	5064	575	2367	3299	19	40	4053	5438	595
	CD	5123	4711	577	1972	2051	17	23	5201	3385	320
	DE	6557	6064	766	1927	1685	8	20	8224	2680	205
	FG	7201	6739	1049	1161	1428	12	49	10256	1892	206
	GH	7029	6536	1812	1450	1219	16	20	9052	1558	263
	I	10058	9628	2281	1115	892	24	19	15373	849	195
	J	2183	2028	771	86	132	5	7	3211	80	53
	N	183	184	1	121	194	0	3	49	187	31
	O	45	12	2	40	7	0	0	9	38	0
	R	774	860	33	1018	415	1	4	169	1063	10
	V	6	6	5	3	3	0	0	1	6	0
	Total	**52612**	**49688**	**8115**	**17682**	**19134**	**117**	**187**	**57207**	**29448**	**3811**
Math 8	**A**	8282	7848	240	6650	7712	15	1	1557	12009	1839
	B	5369	4824	594	2437	3066	9	24	4089	5168	606
	CD	4940	4790	583	1927	2022	8	15	5180	3206	305
	DE	6895	6518	734	1838	1672	18	16	9143	2713	221
	FG	7002	6788	991	1221	1297	8	43	10236	1826	192
	GH	6995	6671	1696	1499	1185	20	8	9265	1479	230
	I	10229	9656	2295	1161	880	19	29	15507	811	210
	J	2193	2131	796	96	143	3	5	3283	59	69
	N	191	166	0	121	173	0	9	54	191	37
	O	68	27	0	62	16	0	0	19	83	0
	R	699	786	32	948	344	0	3	163	934	10
	V	5	15	6	5	4	0	0	5	5	0
	Total	**52868**	**50220**	**7967**	**17965**	**18514**	**100**	**153**	**58501**	**28484**	**3719**

Table 8.1.8: Equating\Linking Sample N-Counts by Gender and Ethnicity: Science

Test Grade	DFG	Male	Female	Asian	Black	Hispanic	Indian Alaska	Hawaii Pacific	White	EconDis	LEP
Sci 8	A	8306	7895	238	6612	7686	15	1	1553	11982	1839
	B	5416	4852	595	2429	3055	9	24	4107	5196	606
	CD	5026	4868	582	1928	2032	9	15	5179	3255	311
	DE	6940	6582	733	1837	1672	19	16	9119	2737	224
	FG	7017	6798	992	1219	1293	8	43	10230	1828	195
	GH	7040	6733	1697	1493	1184	20	8	9263	1504	240
	I	10271	9683	2287	1160	879	19	29	15509	808	210
	J	2201	2142	796	96	143	3	5	3286	59	70
	N	189	166	0	121	172	0	9	53	192	37
	O	72	26	0	63	16	0	0	19	83	0
	R	703	797	32	943	346		3	163	933	11
	V	5	15	6	5	4	0	0	5	5	0
	Total	**53186**	**50557**	**7958**	**17906**	**18482**	**102**	**153**	**58486**	**28582**	**3743**

Descriptive Statistics for the Equating/Linking Samples

Table 8.1.9 displays descriptive statistics for raw scores for the equating/linking samples by grade and test content. Table 8.1.10 summarizes descriptive statistics for raw scores for the equating samples by gender. Tables 8.2.11 through 8.2.13 summarize descriptive statistics for raw scores for the samples by DFG. Note that the maximum score is 75 points for LAL at grade 5 and 78 points for LAL at grades 6 through 8. The maximum score is 50 points for grades 5 and 6 for mathematics and 52 points for mathematics at grades 7 and 8. The maximum score is 54 points for grade 8 science.

Table 8.1.9: Descriptive Statistics for Raw Scores by Grade and Test Content

Test	N	Mean	STD	Min	Max
LAL 5	35472	41.42	10.70	0	70
LAL 6	34080	41.42	10.62	0	70.5
LAL 7	35093	43.34	10.74	0	70
LAL 8	38539	49.68	9.62	1	73
Math 5	101767	32.17	9.98	1	50
Math 6	102427	30.72	10.4	1	50
Math 7	103261	30.75	11.05	1	52
Math 8	104047	33.11	11.48	1	52
Sci 8	103929	31.39	10.47	1	54

Table 8.1.10: Descriptive Statistics for Raw Scores by Gender

Test	Gender	N	Mean	STD	Min	Max
LAL 5	Male	18117	39.96	10.88	1	70
LAL 6	Male	17378	40.29	10.76	0	69.5
LAL 7	Male	17824	42.12	10.88	0	70
LAL 8	Male	19542	47.99	9.93	4	72
Math 5	Male	52100	32.29	10.22	1	50
Math 6	Male	52293	30.79	10.74	1	50
Math 7	Male	52963	30.69	11.40	1	52
Math 8	Male	53251	33.28	11.94	1	52
Sci 8	Male	53186	31.89	10.75	1	54
LAL 5	Female	17355	42.95	10.29	0	69
LAL 6	Female	16702	42.59	10.34	0	70.5
LAL 7	Female	17269	44.60	10.45	0	70
LAL 8	Female	18997	51.43	8.95	1	73
Math 5	Female	49517	32.07	9.71	1	50
Math 6	Female	49953	30.69	10.60	1	50
Math 7	Female	50073	30.85	10.66	1	52
Math 8	Female	50608	32.96	10.96	1	52
Sci 8	Female	50557	30.89	10.14	1	54

Table 8.1.11: Descriptive Statistics for Raw Score by District Factor Group: LAL

Test	DFG	N	Mean	STD	Min	Max
LAL 5	A	5806	34.47	10.86	0	67
	B	2944	36.29	10.76	0	66
	CD	3204	40.06	9.77	9	63
	DE	5448	42.00	9.61	4	67
	FG	3796	42.22	9.77	6	66
	GH	5486	44.45	9.87	3	70
	I	7193	45.71	9.27	4	68
	J	1315	47.14	8.06	15	69
	N	171	37.29	9.41	18	59
	R	109	35.14	10.07	9	59

Table 8.1.11 (continued): Descriptive Statistics for Raw Score by District Factor Group: LAL

Test	DFG	N	Mean	STD	Min	Max
LAL 6	A	5587	34.88	10.72	0	64
	B	2645	37.67	10.70	1	67.5
	CD	3093	41.12	9.41	5	66
	DE	4761	42.72	9.58	4	66.5
	FG	4156	41.23	9.99	1	65.5
	GH	5101	42.46	10.25	0	67
	I	6684	45.15	9.68	2	70
	J	1746	48.90	7.58	0	70.5
	N	244	37.85	8.42	13	55
	O	1	26.50		26.5	26.5
	R	62	34.23	9.59	13.5	56
LAL 7	A	5203	36.47	10.14	0	65
	B	4332	39.46	9.96	4	66
	CD	3317	42.15	9.95	1	68.5
	DE	4865	41.64	11.58	5	67
	FG	4801	44.75	9.46	8	67.5
	GH	4313	46.74	9.40	1	70
	I	6578	48.69	8.79	0	70
	J	1291	51.25	7.46	17.5	69.5
	N	295	36.50	10.23	0	62.5
	R	87	43.99	11.29	14	61
	V	11	46.82	6.25	39	60
LAL 8	A	6145	37.23	11.42	0	69
	B	4222	41.42	10.13	2	67.5
	CD	4094	43.48	9.72	5	68.5
	DE	5037	44.00	8.78	4	68
	FG	4999	45.69	8.91	5	69.5
	GH	4933	47.56	8.39	1	70.5
	I	7070	48.99	7.41	2	72
	J	1676	49.43	7.07	11	72
	N	279	36.39	11.13	7	60.0
	O	3	32.07	12.83	17	55.5
	R	76	45.80	9.79	26	68
	V	5	54.40	5.11	45.5	64

Table 8.1.12: Descriptive Statistics for Raw Scores by District Factor Group: Mathematics

Test	DFG	N	Mean	STD	Min	Max
Math 5	A	16355	26.69	10.16	1	50
	B	10121	28.99	9.83	2	50
	CD	9458	30.34	9.49	1	50
	DE	13071	32.64	9.43	4	50
	FG	12646	32.81	9.26	2	50
	GH	13858	34.40	9.25	1	50
	I	19579	36.18	8.70	1	50
	J	4527	37.83	7.97	3	50
	N	385	29.99	8.87	6	50
	O	15	16.47	10.60	6	41
	R	1752	27.07	9.97	5	50
Math 6	A	15823	24.28	10.25	1	50
	B	10050	27.49	10.05	1	50
	CD	9697	28.83	9.91	1	50
	DE	13321	30.58	9.77	1	50
	FG	12708	31.48	9.63	1	50
	GH	14257	33.14	9.62	2	50
	I	19964	35.25	9.06	4	50
	J	4434	37.46	8.35	3	50
	N	363	28.47	8.76	6	48
	O	27	13.15	8.43	4	40
	R	1768	25.86	10.40	4	50
	V	15	37.60	5.84	27	47
Math 7	A	16254	23.98	10.37	1	52
	B	10432	27.60	10.46	1	52
	CD	9946	29.24	10.43	2	52
	DE	12793	30.87	10.54	2	52
	FG	13994	31.44	10.21	1	52
	GH	13705	33.50	10.43	2	52
	I	19809	35.34	9.95	1	52
	J	4228	38.02	9.24	7	52
	N	368	24.31	9.99	5	50
	O	60	13.92	7.14	4	46
	R	1660	25.03	10.86	3	51
	V	12	30.25	10.50	9	40

Table 8.1.12 (continued): Descriptive Statistics for Raw Scores by District Factor Group: Mathematics

Test	DFG	N	Mean	STD	Min	Max
Math 8	A	16347	25.17	11.34	1	52
	B	10296	29.55	11.36	2	52
	CD	9897	31.75	11.01	1	52
	DE	13572	33.36	10.56	2	52
	FG	13836	34.41	10.40	1	52
	GH	13794	36.16	10.30	1	52
	I	19980	37.95	9.75	2	52
	J	4342	40.62	8.79	4	52
	N	357	24.36	10.55	5	50
	O	98	14.11	8.43	1	47
	R	1508	27.80	11.20	2	52
	V	20	41.10	7.15	18	51

Table 8.1.13: Descriptive Statistics for Raw Scores by District Factor Group: Science

Test	DFG	N	Mean	STD	Min	Max
Sci 8	A	16274	23.46	9.22	1	54
	B	10295	27.56	9.85	2	53
	CD	9907	29.84	9.84	1	54
	DE	13547	31.64	9.54	2	54
	FG	13825	33.09	9.50	1	54
	GH	13785	34.04	9.66	1	54
	I	19972	36.34	9.12	1	54
	J	4345	38.71	8.53	7	53
	N	355	23.49	8.92	7	49
	O	99	16.71	7.10	5	48
	R	1505	27.20	9.88	6	54
	V	20	31.75	7.03	16	47

8.2 Scaling LAL and Mathematics

Item Calibration - LAL and Mathematics

As discussed previously, new standards were set for the 2008 NJ ASK Grades 5 – 8 LAL, Spanish language LAL, and mathematics assessments. Spanish LAL was calibrated separately from the English LAL under advisement from the TAC. Data from the 2008 NJ ASK in LAL, LAL Spanish, and mathematics were used to establish 2008 as the new "base" year for the purposes of future equating and to facilitate standard setting. The standard setting data was used for equating the LAL, while the full datasets of both Mathematics and Spanish LAL were available for equating purposes.

WINSTEPS was able to produce an ability estimate (theta) for every possible number correct, raw score total as one or more examinees obtained a perfect score on each CR item in LAL and mathematics. In some cases, the Spanish LAL required the insertion of simulees to maintain category structure up to the true maximum points available. Table 8.1.1 shows the number of examinees used for the calibrations by grade and content area.

Table 8.2.1 summarizes Infit and Outfit statistics for the 2008 NJ ASK tests. The Infit statistic is more sensitive to unexpected behavior affecting responses near an examinee's ability level while the Outfit statistic is more sensitive to unexpected behavior by examinees far from their ability level (see WINSTEPS Manual, pp.199-202). Infit and Outfit can be expressed as a mean square (MNSQ) statistic or on a standardized metric (ZSTD). MNSQ values are more oriented toward practical significance, whereas Z values are more closely related to statistical significance. As a rule of thumb, the Rasch model fits the data well when the item mean square ("infit") indices are within the range of 0.70 to 1.30. Table 8.2.1 indicates that all infit indices are in the range of 0.70 to 1.30 with the exception of grade 7 LAL. Only one Grade 7 LAL item and one Grade 8 Spanish LAL item exhibited infit statistics greater than 1.30. With the exception of these two items the Rasch model fit the data very well.

Table 8.2.1: Summary of the Infit and Outfit Statistics by Grade and Content Area
2008 NJ ASK

				INFIT		OUTFIT	
		Measure	Model Error	MNSQ	ZSTD	MNSQ	ZSTD
LAL 5	**Mean**	0.00	0.01	1.00	-0.68	1.01	-0.48
	SD	1.00	0.00	0.09	8.27	0.15	8.55
	Max	2.00	0.02	1.21	9.90	1.45	9.90
	Min	-1.63	0.00	0.82	-9.90	0.73	-9.90
LAL 6	**Mean**	0.01	0.01	1.00	-0.71	1.00	-0.55
	SD	1.03	0.00	0.12	8.88	0.20	9.32
	Max	2.32	0.02	1.27	9.90	1.57	9.90
	Min	-2.09	0.00	0.77	-9.90	0.63	-9.90
LAL 7	**Mean**	0.01	0.01	1.00	-1.41	0.99	-1.68
	SD	0.99	0.00	0.12	8.86	0.18	8.96
	Max	2.51	0.02	1.33	9.90	1.38	9.90
	Min	-1.56	0.00	0.81	-9.90	0.68	-9.90
LAL 8	**Mean**	0.01	0.01	1.00	-0.48	1.01	0.03
	SD	1.11	0.00	0.10	7.75	0.19	7.89
	Max	2.24	0.02	1.27	9.90	1.58	9.90
	Min	-1.83	0.00	0.84	-9.90	0.69	-9.90
LALS 5	**Mean**	0.00	0.09	1.00	0.03	1.02	0.28
	SD	0.76	0.02	0.08	1.87	0.13	2.00
	Max	1.71	0.15	1.13	4.21	1.38	4.07
	Min	-1.59	0.03	0.80	-3.84	0.77	-3.78
LALS 6	**Mean**	0.00	0.08	1.00	0.05	1.03	0.30
	SD	0.77	0.02	0.10	2.45	0.14	2.60
	Max	1.35	0.12	1.25	5.82	1.34	5.93
	Min	-1.87	0.02	0.80	-4.08	0.76	-4.36
LALS 7	**Mean**	0.00	0.08	1.00	0.04	1.03	0.35
	SD	0.62	0.02	0.10	2.50	0.14	2.68
	Max	1.06	0.10	1.24	5.14	1.45	5.85
	Min	-1.38	0.03	0.79	-4.56	0.79	-4.57
LALS 8	**Mean**	0.00	0.08	1.00	0.26	1.01	0.35
	SD	0.96	0.02	0.10	2.55	0.14	2.60
	Max	2.28	0.13	1.32	5.87	1.39	5.88
	Min	-2.03	0.03	0.80	-3.82	0.73	-3.82

Table 8.2.1(continued): Summary of the Infit and Outfit Statistics by Grade and Content Area 2008 NJ ASK

				INFIT		OUTFIT	
		Measure	Model Error	MNSQ	ZSTD	MNSQ	ZSTD
Math 5	**Mean**	0.00	0.01	1.00	-0.88	1.00	-0.99
	SD	0.95	0.00	0.10	8.99	0.18	8.91
	Max	1.71	0.01	1.29	9.90	1.46	9.90
	Min	-1.74	0.00	0.79	-9.90	0.71	-9.90
Math 6	**Mean**	0.00	0.01	1.00	-0.96	1.00	-0.91
	SD	0.74	0.00	0.10	9.49	0.17	9.19
	Max	1.55	0.01	1.30	9.90	1.47	9.90
	Min	-1.61	0.00	0.84	-9.90	0.75	-9.90
Math 7	**Mean**	0.00	0.01	0.99	-1.88	1.00	-1.61
	SD	0.91	0.00	0.11	8.84	0.22	8.91
	Max	1.72	0.01	1.28	9.90	1.69	9.90
	Min	-1.65	0.00	0.81	-9.90	0.68	-9.90
Math 8	**Mean**	0.00	0.01	0.99	-0.36	1.01	0.11
	SD	0.80	0.00	0.10	9.60	0.19	9.18
	Max	1.40	0.01	1.18	9.90	1.58	9.90
	Min	-2.03	0.00	0.80	-9.90	0.67	-9.90

Equating Procedures for Special Forms

This section describes the equating procedures for scores from the Large Print, Braille, and Breach forms of the 2008 NJ ASK. Braille test forms were constructed by removing items from the corresponding regular test forms. Items that were removed from the regular test forms are summarized in Table 8.2.2. No items were removed for the Large Print or Breach, thus no special equating was required for these forms.

Table 8.2.2: Items Removed from the 2008 Braille Calibrations

Content Area	Braille
LAL 5	NA
LAL 6	NA
LAL 7	NA
LAL 8	NA
Math 5	44*
Math 6	22*, 23
Math 7	46*
Math 8	46*
Science 8	2, 32*, 43

* Constructed-response items; all other items are multiple-choice.

Several assumptions had to be made in order to equate the scores of the Braille tests to the scores of the regular test. First, it was assumed that the latent trait measured by the Braille tests and the regular test was the same. Given the fact that the same items were used across the tests within each content area, with the exception of the removed items, it seemed reasonable to assume that changes to item format or item presentation would not greatly change the overall latent trait or construct measured by each assessment.

A second, stronger assumption, however, was that item parameters across the tests within each content area were identical. This of course is a very strong assumption considering the different item formats across the tests. However, this assumption was necessary because sample sizes for the Braille tests were too small to get reliable parameter estimates. Moreover, making these assumptions is considered common and current best practice for these populations. Because the first assumption noted above is reasonable, i.e., for each test the LAL assessment measures language arts and the mathematics assessment measures mathematics, the following steps for equating the Braille tests to the regular tests were used:

- Conduct an anchored item calibration. The items in Table 8.2.2 were removed and the parameters and steps of the Braille test items were fixed with the estimates resulting from the corresponding regular test items.

- Transform the theta metric to the scale score metric. Because the theta values obtained from the anchored calibration and those obtained from the regular test score calibration are on the same metric, the transformation functions applied to the regular test scores can be applied to the Braille test scores.

- Create raw score to scale score look-up tables for each Braille test. In cases where no raw score corresponds to the cut scale scores (200 for Proficient and 250 for Advanced Proficient), the raw score point immediately below the cut score was assigned as the cut point scale score.

Scoring Tables Development

Total scores for the 2008 NJ ASK 5-8 were reported in scale scores with a range of 100–300. Note that scores of 100 and 300 were a theoretical floor and ceiling and may not actually have been observed for some grades and/or content areas. However, for each test, for a perfect raw score, the scale score was set to 300. A scale score of 200 represents the cut point between Partially Proficient (PP) and Proficient (P) while a scale score of 250 represents the cut point between Proficient and Advanced Proficient (AP). The scale score ranges are as following:

Partially Proficient	100 to 199
Proficient	200 to 249
Advanced Proficient	250 to 300

The 2008 NJ ASK scale scores are linearly related to the theta metric calibrated using WINSTEPS. The scoring tables were produced through the following steps:

- Determine cut score points on the raw metric through standard setting;
- Calibrate Rasch parameters with the 2008 NJ ASK 2008 standard setting sample data for LAL grades 5-8;
- Calibrate Rasch parameters with the 2008 NJ ASK 2008 complete datasets for mathematics grades 5-8;
- Find cut score points on the theta metric;
- Calculate intercept and slope of theta-to-scale-score transformation function; and
- Create raw score to scale score conversion tables.

Standard setting procedures were described in Part 6 of this Technical Report and in greater detail in the Standard Setting Report. Cut scores established through the standard setting are shown in Table 8.2.3.

Table 8.2.3: 2008 Standard Setting Cut Scores*

	Proficient	**Advanced Proficient**	**Total Points Possible**
	Raw Score	Raw Score	
LAL 5	40.0	57.5	75
LAL 6	41.5	59.0	78
LAL 7	39.0	55.0	78
LAL 8	42.5	60.0	78
Math 5	25	40	50
Math 6	25	41	50
Math 7	27	42	52
Math 8	29	43	52

*Cut scores were approved by the New Jersey State Board of Education on July 16, 2008.

Linear transformations were applied to theta estimates and scale scores. The following formula was used to obtain the slopes and intercepts for the transformation functions:

$$sc(y) = \left[\frac{sc(y_2) - sc(y_1)}{\theta_2 - \theta_1}\right] y + \left\{(sc(y_1) - \left[\frac{sc(y_2) - sc(y_1)}{\theta_2 - \theta_1}\right]\theta_1\right\},$$

where θ_1 and θ_2 are person parameter estimates that correspond to the cut score points, and $sc(y_1)$ and $sc(y_2)$ are scale score points.

The above formula was adopted from Kolen and Brennan (2004, p. 337[15]). For 2008 NJ ASK, $sc(y_1)$ was 200 and $sc(y_2)$ was 250. Slopes and intercepts of the transformation functions are

[15] Kolen, M. J., & Brennan, R. L. (2004). *Test equating: Methods and practice*. NY: Springer.

summarized in Table 8.2.4. A raw score to scale score look-up table for each test form is attached as Appendix F.

In addition to the above scaling transformation, for the 2007 operational tests, the following rules were applied:

1) The raw score cut (e.g., for Proficient) was selected as the lowest raw score associated with a rounded scale score of 200. The same strategy was also followed for a scale score of 250.
2) If there was no raw score associated with a rounded scale score of 200, the raw score with the highest scale score below 200 was selected as the cut score, and assigned a scale score of 200. For example, if two consecutive raw scores were associated with rounded scale scores of 198 and 201, the scale score of 198 was moved up to 200. The same strategy was also followed for a scale score of 250.
3) Scaled scores below 100 were rounded up to 100.
4) Scaled scores above 300 were rounded down to 300.
5) For each test, for a perfect raw score, the scale score was set to 300.

Table 8.2.4: Summary of Slopes and Intercepts of Theta to Scale Score Transformation Functions by Grade Level and Content Area

Test	Grade	Proficient			Advanced Proficient			Slope	Intercept
		RS	Theta	SS	RS	Theta	SS		
LAL	5	40	0.2826	200	57.5	2.0426	250	28.4088	191.9725
	6	41.5	0.4406	200	59	2.3707	250	25.9059	188.5853
	7	39	0.0489	200	55	1.5608	250	33.0714	198.3828
	8	42.5	0.3421	200	60	2.5797	250	22.3454	192.3554
Math	5	25	0.1457	200	40	1.7024	250	32.1190	195.3219
	6	25	0.0965	200	41	1.6816	250	31.5440	196.9560
	7	27	0.2845	200	42	1.7620	250	33.8428	190.3704
	8	29	0.3518	200	43	1.7236	250	36.4506	187.1752
Science	8	20	-0.226	200	38	1.221	250	33.5121	205.1609

8.3 Scaling and Equating Science

The 2008 NJ ASK grade 8 Science test scores were first equated to the "base" scale and then re-centered to the "reported" scale of the Grade Eight Proficiency Assessment (GEPA). The following steps were implemented to accomplish the scaling and equating:

(1) Calibrate the 2008 science assessment without constraint;
(2) Examine the stability of the common items;
(3) Equate the 2008 science assessments to the GEPA "base" scale; and
(4) Re-center the 2008 equated scale to the GEPA original, or "reported" scale.

Raw score to scale score conversion tables are reported in Appendix F. The following sections provide more detail about the procedures and results of the equating for the 2008 NJ ASK Science.

(1) Calibrate 2008 NJ ASK Science Assessment without Constraint

The main purpose of this calibration was to examine the stability of common items, or linking items, administered across the two years (i.e., 2007 and 2008). For each test, a calibration was executed "freely" without constraint.

(2) Examine the Stability of Common Items

The stability of common items refers to the expectation that common items function the same way for the groups involved in an equating study. It is recommended that the stability of common items be examined visually and statistically (Kolen and Brennan, 2004[16]). For example, scatter plots can be used to check visually for outlier common items. For NJ ASK, Rasch measures for the common items from the "base" calibrations and from the 2008 unconstrained or "free" calibrations were plotted against each other. The scatter points for items that function the same should fall on a straight line. Outlier items will not fall on the straight line and thus can be seen visually.

In addition to visual examination, the stability of common items should be studied analytically. It is recommended that a 0.30-logistic unit be applied as a cut criterion for removing "unstable" common items (Miller, Rotou, & Twing. 2004[17]). That is, any common item that has a difference bigger than 0.30 logits (after adjustments) between the two equating groups should be removed from the common item set and treated as a unique item.

In the 2008 NJ ASK Science equating study, both visual and analytical methods were applied. Figure 8.3.1 presents a scatter plot of the anchor items for 2008 NJ ASK Science grade 8 that were used for visual examination. Adjusted differences in Rasch logits for anchor items between the "base" calibrations and the 2008 "free" calibrations are summarized in Table 8.3.1. Note that one item was removed from the common item sets: item #14 (adjusted Rasch difference = 0.532 logits).

3) Equate the 2008 Science Assessments to the GEPA "Base" Scale

It was assumed that the latent trait measured by the 2008 operational test and the GEPA was the same. Given the fact that common anchor items were used across the two years, and that the blueprint and item specifications were the same, it seems reasonable to assume that the underlying latent trait or construct measured by each assessment was the same. To equate the 2008 Science assessment to the GEPA "base" scale, the Rasch values (difficulties and Rasch-Anderich thresholds for the constructed-response items) of the common items were fixed to the "base"

[16] Kolen, M. J., & Brennan, R. L. (2004). *Test equating: Methods and practice*. NY: Springer.

[17] Miller, G.E., Rotou, O., & Twing, J.S. (2004). Evaluation of the 0.3 logits screening criterion in common item equating. *Journal of Applied Measurement*, 5(2), 172-177.

calibrations. This resulted in a raw score to theta conversion on the "base" scale for the 2008 assessment (i.e., the 2008 assessment was scaled on to the GEPA "base" metric).

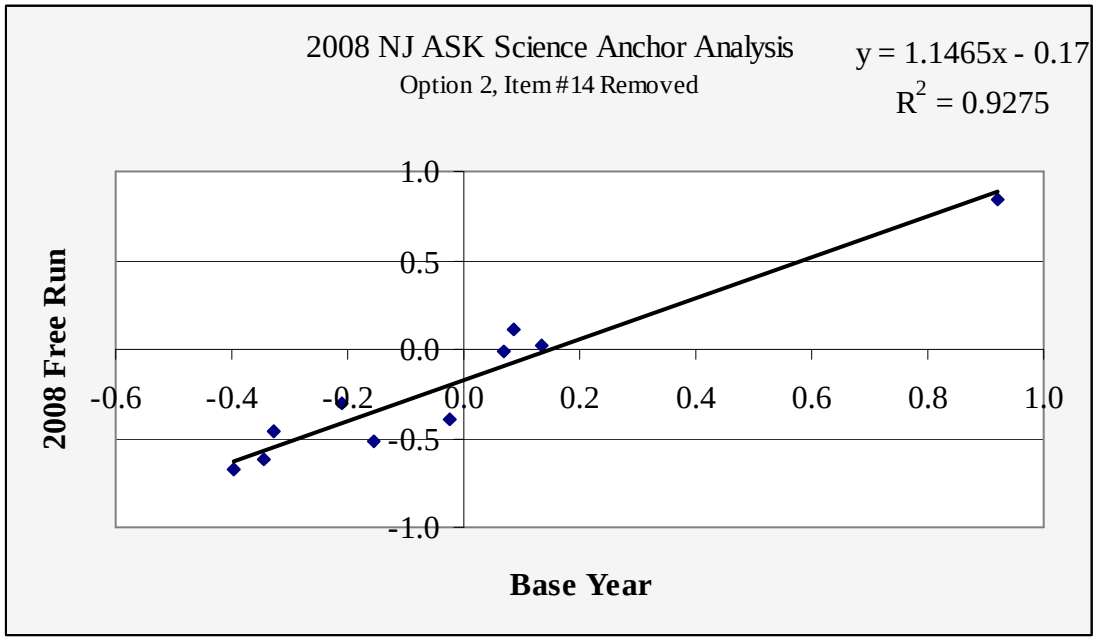


Figure 8.3.1: Scatter Plot for Anchor Items for Science Grade 8

Table 8.3.1: Adjusted Difference in Rasch Logits for Anchor Items between the Base" Calibrations and the 2008 "Free" Calibrations (Science)

Test Position	Type	Base Year	2008 Free Calibrations	Adjusted	Difference	Abs-Diff	Decision
3	MC	0.919	0.841	1.014	-0.095	0.095	
9	MC	-0.023	-0.394	-0.221	0.198	0.198	
14	MC	0.607	1.018	1.139	-0.532	0.532	DROP
22	MC	-0.155	-0.513	-0.339	0.185	0.185	
26	MC	0.069	-0.009	0.165	-0.096	0.096	
30	MC	0.085	0.116	0.289	-0.204	0.204	
33	MC	-0.210	-0.303	-0.129	-0.081	0.081	
34	MC	0.133	0.017	0.191	-0.058	0.058	
35	MC	-0.346	-0.612	-0.439	0.093	0.093	
42	MC	-0.397	-0.673	-0.499	0.102	0.102	
47	MC	-0.329	-0.459	-0.285	-0.044	0.044	
	Average	**-0.025**	**-0.199**	**-0.025**	**0.000**	**0.116**	
	EQK =	**0.174**	**Greatest Difference in ABSOLUTE Value =**		**0.204**		

4) Re-center the 2008 equated scale to the GEPA original, or "reported" scale

A conversion table from the GEPA "reported" scale to the GEPA "base" scale was established so the 2008 equated scale could be re-centered to the GEPA "reported" scale. This was accomplished through number correct raw score because the test is exactly the same for the GEPA "reported" and "base" scales. For example, assume the scales resembled the following:

---Reported---		-----Base-----	
RS	**Theta**	**RS**	**Theta**
1	-2.0	1	-2.5
2	-1.5	2	-2.0
3	-1.0	3	-1.5
4	-0.5	4	-1.0
5	0.0	5	-0.5
6	0.5	6	0.0
7	1.0	7	0.5
8	1.5	8	1.0
9	2.0	9	1.5
10	2.5	10	2.0

Using the above conversion table, a "base" theta of 1.0 (raw score 8) equates to a "reported" theta of 1.5 (also a raw score of 8). While the 2008 assessment was placed on the GEPA "base" scale, raw scores had to be used to re-center the 2008 assessment onto the GEPA "reported" scale. This final step of re-centering the 2008 equated scale to the GEPA "reported" scale was necessary because the GEPA "reported" scale must be maintained over multiple years. The interpolation required to re-center the equated 2008 scale is described in more detail below.

Because the raw scores between 2008 and GEPA do not match as they did between the GEPA "reported" and GEPA "base" scales, interpolation between raw scores and between scale scores on both scales had to be performed to allow raw scores from 2008 to be translated from the "base" scale to the "reported" scale.

The table below shows how this was accomplished:

----------**2007**----------			----**2008**----	
Reported		**Base**	**Base**	
Theta	**RS**	**Theta**	**Theta**	**RS**
-2.0	1	-2.5	-2.3	1
-1.5	2	-2.0	-1.8	2
-1.0	3	-1.5	-1.3	3
-0.5	4	-1.0	-0.8	4
0.0	5	-0.5	-0.3	5
0.5	6	0.0	0.2	6
1.0	7	0.5	0.7	7
1.5	8	1.0	1.2	8
2.0	9	1.5	1.7	9
2.5	10	2.0	2.2	10

In the previous example, a 2008 theta of 1.7 is 40% of the way between 1.5 and 2.0 on the "base" scale. In raw score units, 40% of the way between raw scores 9 and 10 is 9.4. A raw score of 9.4 translates into a "reported" theta of 2.2, which is also 40% of the way between 2.0 and 2.5 on the "reported" scale. A raw score of 9 in 2008 would therefore be equated (or re-centered) to a theta value of 2.2 on the GEPA "reported" scale.

The interpolations were accomplished using an MS Excel calculator that was developed for the purpose of this project and verified through an independent SAS program. Remember that the main task was to link the "base" thetas from the 2008 operational tests to the GEPA "reported" scale.

The method of producing the scoring tables for the 2008 NJ ASK Science is detailed in Section 8.2. Table 8.2.4 shows the slopes and intercepts of the theta to scale score transformation for science.

8.4 Linking to 2007 for AYP Reporting - LAL and Mathematics

In order to meet the Adequate Yearly Progress (AYP) reporting requirements for this transition year, linking the performance on the 2008 NJ ASK to the 2007 NJ ASK was required. This link provided a standard by which achievement of proficiency goals for AYP purposes could be assessed (e.g., old scale, new scale, and a safe-harbor provision).

The linking was accomplished via a common item approach. Item parameter values were fixed to their known values from 2007. This in effect shifts the calibrated difficulty of the 2008 items to the same scale as the 2007 tests. Thus, the difficulty of the 2007 and 2008 tests can be said to be linked or related, despite some content differences between the years. An example of an anchored WINSTEPS control file with similar specifications to those which were used operationally is displayed below in Figure 8.4.1.

```
&INST
NI=42
TITLE='NJ ASK Grade 5 Math Spring 08, ANCHORED RUN'
ITEM1=1
MODELS=R
GROUPS=0
PVALUE=Y
xwide=1
CODES=0123
DATA=mathbase.dat
STKEEP=Y
IFILE=mathanc.itm
IAFILE=mathanc.iaf
SFILE=mathanc.san
SAFILE=mathanc.saf
UDECIM=5
LCONV=0.000001
MUCON=50
ASCII=Y
TABLES='0010000000000000000100'
&END
...
END NAMES
```

Figure 8.4.1. Example Control File—Anchored Calibration.

Scaling was accomplished in the same manner as described in Section 8.2 except the slopes and intercepts of the 2007 NJ ASK and GEPA LAL and mathematics assessments were applied to the 2008 tests. This resulted in theta values or ability estimates anchored to the 2007 scale. As the 2007 and 2008 NJ ASK for LAL and mathematics in grades 5 through 8 differ significantly in terms of item type, passage length, and testing time it is inappropriate to make direct comparisons of student performance across these tests.

PART 9: RELIABILITY

The New Jersey Department of Education is required by federal law to ensure that the instruments it uses to measure student achievement for school accountability provide reliable results. This section shows that results of the 2008 NJ ASK 5–8 measure student achievement in a reliable manner. The size of the measurement error associated with test scores is reasonable and can be taken into account when interpreting the scores for individual students.

9.1 Classical Reliability Estimates of Test Scores

Reliability and Measurement Error

Reliable student test scores, like other reliable measurements, are consistent. More specifically, measurement components are consistent with each other. Results of the components vary, but they do so within tolerable limits. In general, measurement error and reliability are inversely related. When measurement error is large, reliability is small. Increasing reliability by minimizing measurement error is an important goal in the construction of any test.

The NJ ASK assessments, like many other standardized achievement tests, were designed under the assumptions of Classical Test Theory (CTT). This approach builds on the notion of an ideal, error-free or true measurement score. Any observed measurement, such as test score X, is defined as a composite of true score T and its associated error:

$$X = T + \text{error}$$

Estimating the size of the measurement error associated with the true score is the key to estimating reliability. Errors in measurement can result from any of a multitude of factors, including environmental factors (e.g., testing conditions) and examinee factors (e.g., fatigue, stress). Feldt and Brennan (1989)[18] note, "Quantification of the consistency and inconsistency in examinee performance constitutes the essence of reliability analysis" (p. 105). CTT provides a means for this quantification of examinee inconsistency (i.e., measurement error).

The definitions or assumptions in CTT lead to several important properties. For example, it can be demonstrated that

$$\sigma_x^2 = \sigma_t^2 + \sigma_e^2,$$

or observed score variance equals the sum of true score variance plus error variance. The relationships among variance terms (i.e., $\sigma_x^2, \sigma_t^2, \sigma_e^2$) are critical to a more thorough understanding of important CTT concepts, including reliability and the standard error of measurement. For example, CTT reliability is defined as the correlation between observed scores on parallel forms, which is equal to

[18] Feldt and Brennan (1989). Reliability. In R. L. Linn (Ed.), *Educational Measurement* (3rd ed.). Washington, DC: American Council on Education.

$$\rho_{x_1 x_2} = \sigma_t^2 \Big/ \sigma_x^2.$$

Reliability in CTT is thus conceptualized as true score variance divided by observed score variance. With just a few algebraic steps, the CTT definition of the standard error of measurement (SEM) can be shown as

$$\sigma_e = \sigma_x \sqrt{1 - \rho_{x_1 x_2}}.$$

Although the conceptualization of reliability and SEM is relatively straightforward, issues underlying the estimation of reliability are not. Reliability can be estimated via the correlation of scores on parallel forms or from test-retest data, or it can be estimated from a single test administration using any one of a variety of techniques (e.g., Brown, 1910; Cronbach, 1951; Kuder & Richardson, 1937)[19]. A very popular technique for estimating reliability from a single test administration is Cronbach's coefficient alpha.

Test Metrics and Units of Analysis

The NJ ASK quantifies student achievement on three different metrics: number correct raw score, IRT scale, and performance score. While it is the knowledge and skills of individual students that are measured, student scores are aggregated and disaggregated into various units (e.g., school by grade, student group by grade, school, district, and state). Measurement error specific to each metric and each unit of analysis is taken into account when results are reported and accountability decisions are made. It is the responsibility of test developers to maximize reliability and minimize error by (1) identifying likely sources of error; (2) controlling the conditions of error; (3) estimating the size of error and/or level of reliability; and (4) reporting the estimates by metric and unit of analysis.

Sources of Measurement Error

The scoring of student responses to multiple-choice items is done electronically. Scoring error may result from improper coding and extraneous marks on scanable response sheets. The size of this sort of error is usually small and is controlled though proper test administration procedures, including instructions on how to fill out response sheets and how to erase extraneous markings. MI also uses procedures to minimize this error.

MI employs a multiple-choice verification process for any student whose bubbling errors, if corrected, would give them a passing score. This involves identifying the affected MC answer pages and physically reviewing each one for each student in this group. Two of the most common types of errors are use of pen rather than pencil and double-bubbling, which often turns out to be

[19] Brown, W. (1910). Some experimental results in the correlation of mental abilities. *British Journal of Psychology*, *3*, 296–322. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*, 297–334. Kuder, G. F., & Richardson, M. W. (1937). The theory of the estimation of test reliability. *Psychometrika*, *2*, 151–160.

just a bad erasure. If the student's responses are clear to the human eye, as opposed to the machine's eye, the correct response is recorded and the score is changed.

CR items are susceptible to scoring error due to ambiguity in scoring rubrics as well as to differences among raters. Rubrics must be written to balance generality and specificity, covering the range of student responses, while at the same time allowing raters to easily identify the response characteristics distinguishing each score category. To minimize error due to raters, MI thoroughly trains raters and monitors the scoring process. Only raters who meet MI's criteria for consistent scoring during training are retained as scorers. MI monitors scoring by routinely computing and recording inter-rater agreement.

Evidence of Raw Score Internal Consistency

Consistency of individual student performance was estimated using coefficient alpha. As previously noted, coefficient alpha is conceptualized as the proportion of total raw score variance that may be attributed to a student's true score variance. Ideally, more score variance should be attributable to true test scores than to measurement error. Alpha is an appropriate index of internal consistency for use on untimed tests such as NJ ASK.

Separate analyses were performed for each grade level and content area. Both MC and CR items scores were used in the computations. Coefficient alpha can be interpreted as a lower bound to reliability and was estimated using the following formula:

$$\alpha_{\text{Cronbach}} = \frac{n}{n-1}[1-\frac{\sum_{i=1}^{n}\sigma_{Y_i}^2}{\sigma_X^2}],$$

where n is the number of items, $\sigma_{Y_i}^2$ is the variance of item i, and σ_X^2 is the variance of total score. SEM can be interpreted as "the square root of the average of the person-specific error variances of all examinees who participated in the reliability estimation experiment" (Traub, 1994, p. 114[20]). SEMs were calculated using the following formula:

$$SEM = S_X\sqrt{1-\alpha_{\text{Cronbach}}},$$

where S_X is the standard deviation of observed total scores. Table 9.1.1 summarizes coefficient alpha and SEMs by content and form. Tables 9.1.2 through 9.1.5 summarize coefficient alpha and SEMs of content clusters by test.

[20] Traub, R. E. (1994). Reliability for the social sciences, v3. Thousand Oaks, CA: Sage.

Table 9.1.1: Summary of Coefficient Alpha and SEM by Grade and Content Area 2008 NJ ASK Operational Forms

Test	Form*	Grade	Ncount	Cronbach Alpha	SEM
LAL	OP	5	100700	0.89	3.54
	OP	6	101216	0.89	3.48
	OP	7	106143	0.89	3.58
	OP	8	104864	0.90	3.17
Spanish LAL	SP	5	554	0.83	4.03
	SP	6	660	0.83	3.95
	SP	7	713	0.82	3.82
	SP	8	663	0.85	3.82
Math	OP	5	101093	0.90	3.13
	OP	6	101593	0.90	3.26
	OP	7	102431	0.91	3.26
	OP	8	103274	0.92	3.25
Spanish Math	SP	5	574	0.85	3.05
	SP	6	670	0.84	3.18
	SP	7	713	0.86	3.06
	SP	8	663	0.87	3.20
Science	OP	8	103912	0.89	3.44
Spanish Science	SP	8	690	0.76	3.29

*OP: Operational Test SP: Spanish Version; N-counts were insufficient to produce values for Braille and Large Print.

Table 9.1.2: Grade 5 Coefficient Alpha and Standard Error Measurement for Clusters – 2008 NJ ASK Operational Forms

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**36**	**8**		**75**	**0.89**	**3.54**
Writing		2		15	0.62	1.57
Reading	36	6		60	0.88	3.16
Working with Text	15	2		23	0.77	1.95
Analyzing Text	21	4		37	0.80	2.49
Math	**32**	**4**	**6**	**50**	**0.90**	**3.13**
Number & Numerical Operations	*7*	*1*	*2*	12	0.67	1.62
Geometry & Measurement	*7*	*1*	*2*	12	0.70	1.66
Patterns & Algebra	*9*	*1*	*1*	13	0.65	1.55
Data Analysis, Probability, & Discrete Mathematics	*9*	*1*	*1*	13	0.75	1.44
Problem Solving	12	3	2	23	0.80	2.29

Table 9.1.3: Grade 6 Coefficient Alpha and Standard Error Measurement for Clusters – 2008 NJ ASK Operational Forms

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**36**	**8**		**78**	**0.89**	**3.48**
Writing		2		18	0.59	1.60
Reading	**36**	**6**		60	0.89	2.94
Working with Text	20	1		24	0.77	2.02
Analyzing Text	16	5		36	0.82	2.18
Math	**32**	**4**	**6**	**50**	**0.90**	**3.26**
Number & Numerical Operations	7	1	2	12	0.72	1.60
Geometry & Measurement	7	1	2	12	0.67	1.61
Patterns & Algebra	9	1	1	13	0.72	1.63
Data Analysis, Probability, & Discrete Mathematics	9	1	1	13	0.66	1.69
Problem Solving	13	3	4	26	0.84	2.41

Table 9.1.4: Grade 7 Coefficient Alpha and Standard Error Measurement for Clusters – 2008 NJ ASK Operational Forms

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	CR/ECR	SCR			
LAL	**36**	**8**		**78**	**0.89**	**3.58**
Writing		2		18	0.61	1.62
Reading	**36**	**6**		60	0.89	3.01
Working with Text	21	1		25	0.80	2.12
Analyzing Text	15	5		35	0.79	2.24
Math	**32**	**4**	**8**	**52**	**0.91**	**3.26**
Number & Numerical Operations	8	1	2	13	0.70	1.52
Geometry & Measurement	8	1	2	13	0.75	1.67
Patterns & Algebra	8	1	2	13	0.76	1.62
Data Analysis, Probability, & Discrete Mathematics	8	1	2	13	0.71	1.72
Problem Solving	11	12	3	26	0.83	2.49

Table 9.1.5: Grade 8 Coefficient Alpha and Standard Error Measurement for Clusters – 2008 NJ ASK Operational Forms

	Number of Items			Number of Possible Points	Alpha	SEM
	MC	**CR/ECR**	**SCR**			
LAL	**36**	**8**	N/A	**78**	**0.90**	**3.17**
Writing		2	N/A	18	0.67	1.44
Reading	36	6	N/A	60	0.89	2.73
Working with Text	22	2	N/A	30	0.83	1.93
Analyzing Text	14	4	N/A	30	0.78	1.85
Math	**32**	**4**	**8**	**52**	**0.92**	**3.25**
Number & Numerical Operations	8	1	2	13	0.77	1.58
Geometry & Measurement	8	1	2	13	0.69	1.86
Patterns & Algebra	8	1	2	13	0.77	1.54
Data Analysis, Probability, & Discrete Mathematics	8	1	2	13	0.71	1.54
Problem Solving	19	3	6	34	0.88	2.69
Science	**45**	**3**	N/A	**54**	**0.89**	**3.44**
Life Science	18	1	N/A	21	0.76	2.10
Physical Science	13	1	N/A	16	0.67	1.98
Earth Science	14	1	N/A	17	0.76	1.88
Knowledge	*9*	N/A	N/A	9	*0.63*	1.31
Application	36	3	N/A	45	0.87	3.16

9.2 Reliability of Performance Classifications

Two measures of reliability are presented below in Table 9.2.1. Stratified Alpha is used to assess the reliability of the different item types, e.g., multiple choice and constructed response. Stratified Cronbach Alpha can be calculated using the following formula:

$$\text{Stratified } \alpha = 1 - \Sigma\sigma_i^2(1-\rho_{ii'})/\sigma_t^{2\,21}$$

where

σ_i^2 = variance of score on cluster *i*,

σ_t^2 = variance of total score, and

$\rho_{ii'}$ = reliability coefficient of score on cluster *i*.

The decision consistency[22] measure is an estimate of how reliably the test classifies students into the performance categories (Partially Proficient, Proficient, and Advanced Proficient).

Table 9.2.1: Consistency Indices for Performance Levels – 2008 NJ ASK Operational Forms

Test	Grade	Stratified Alpha		Decision Consistency
		Coefficient	SEM	
LAL	5	0.90	3.36	0.77
	6	0.91	3.21	0.77
	7	0.91	3.30	0.73
	8	0.92	2.90	0.74
Math	5	0.91	3.00	0.78
	6	0.91	3.10	0.79
	7	0.92	3.07	0.79
	8	0.93	3.08	0.80
Science	8	0.90	3.36	0.79

[21] Maryland school assessment – Reading: Grades 3 through 8 (2004). http://www.marylandpublicschools.org/NR/rdonlyres/26BD65BE-6F27-4F35-8699-139BC98BF99F/8812/2004_MDTech_Reading_Report_3.pdf

[22] Estimates of decision reliability and their standard errors in mastery testing based on the beta- binomial model (1979)
Program written by Huynh Huynh, College of Education, University of South Carolina, Columbia, South Carolina 29208.

Item Maps and Test Information Functions

Item maps for LAL, mathematics, and science are presented in Figures 9.2.1 – 9.2.9. These Figures indicate how well the item difficulties and person ability levels match.

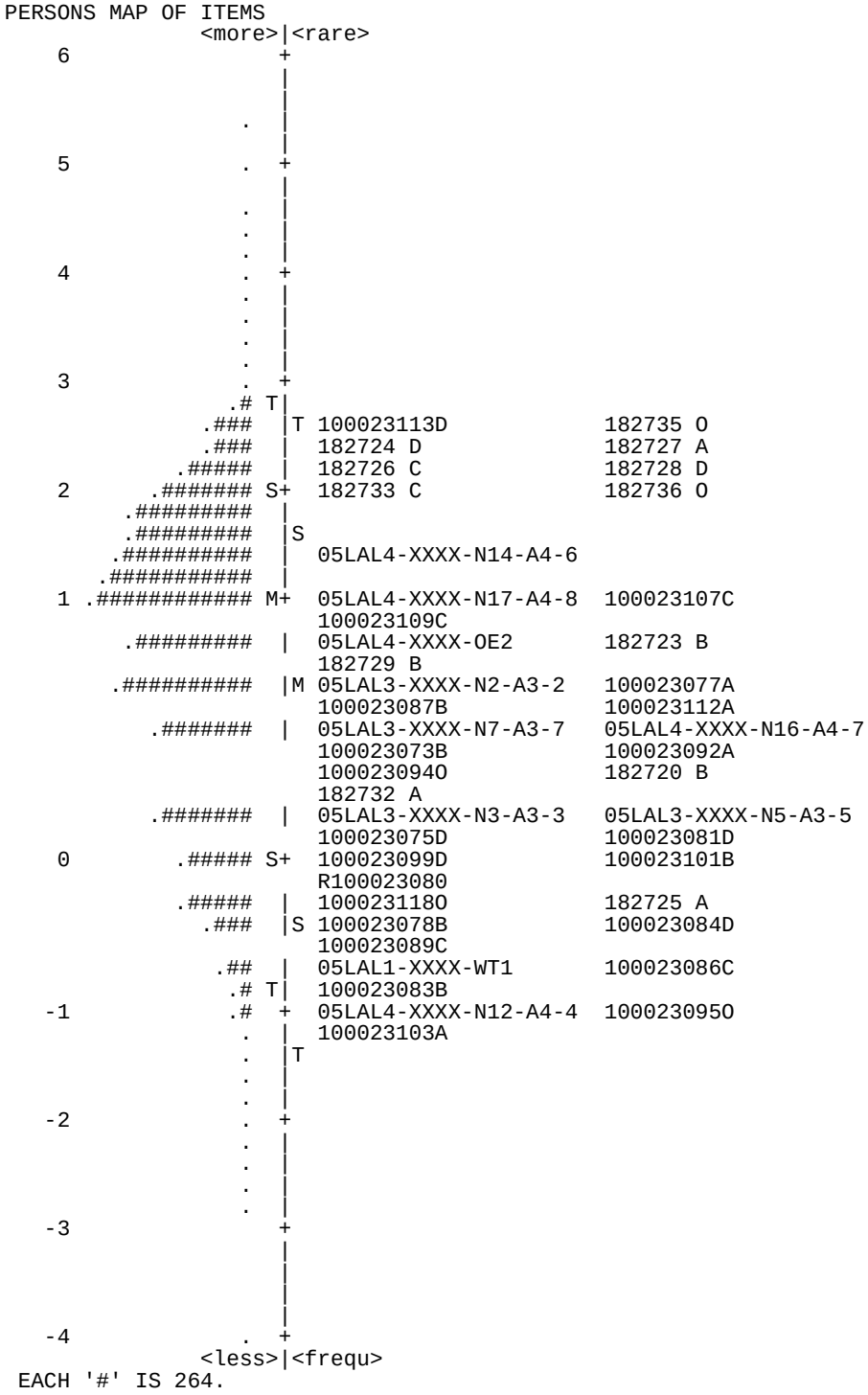


Figure 9.2.1: Item Map LAL Grade 5

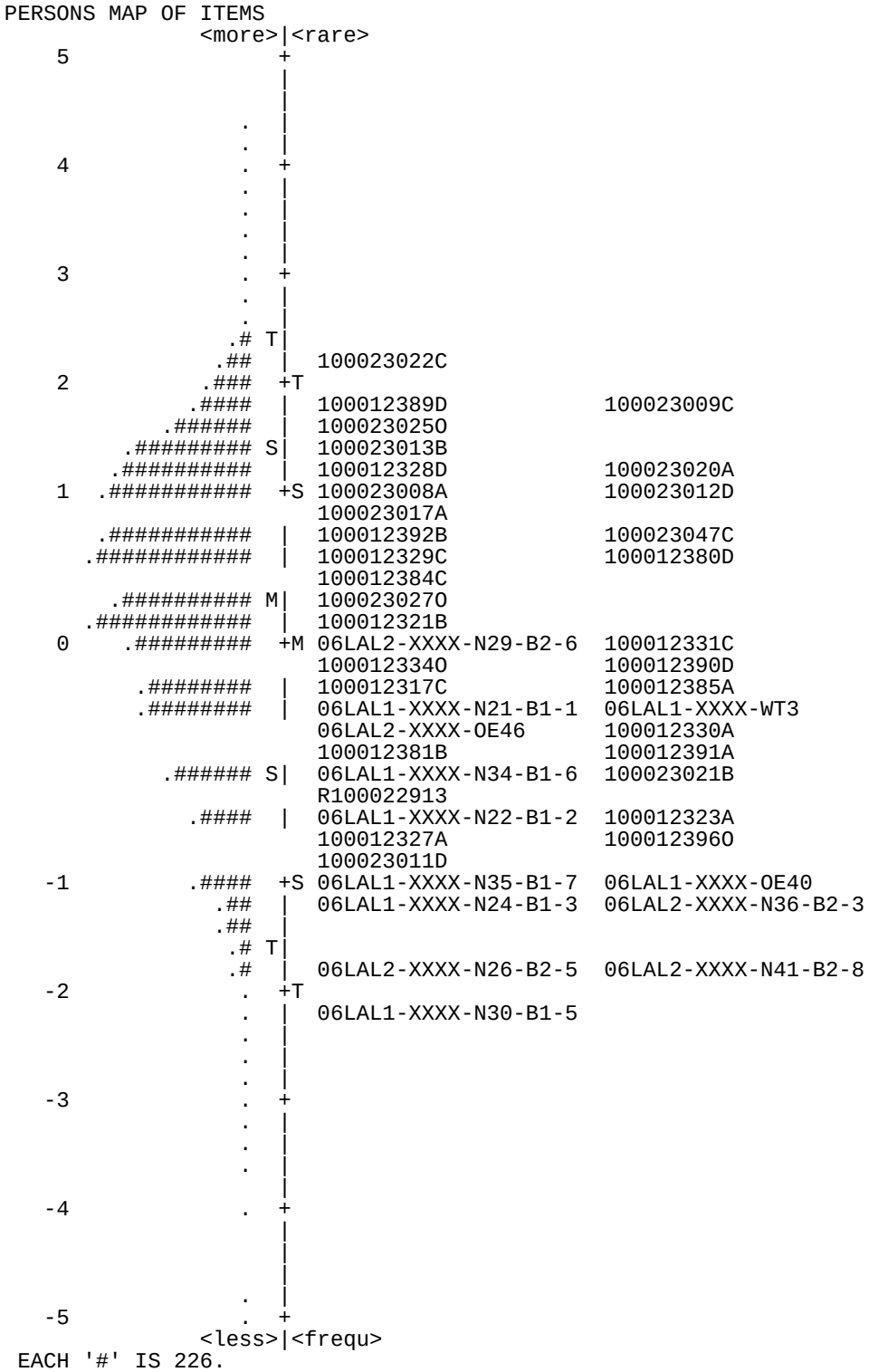


Figure 9.2.2: Item Map LAL Grade 6

```
PERSONS MAP OF ITEMS
               <more>|<rare>
    5             .  +
                  .  |
                  .  |
    4             .  +
                  .  |
                  .  |
    3            .# T+  8LA4-036O-X01
                .##  |
              .#####  |T 07LAL1-XXXX-OE13       183042W2O
    2        .###### S+  100023256A3O           100023257A3O
       .############  |  183032W4C
       .############  |S 07LAL1-XXXX-N12-C1-10  07LAL2-XXXX-WT6
                        100023233               183033A2C
                        183040W3D               183044A4O
                        8LA4-32D-X01
    1 ############## M+  07LAL1-XXXX-N11-C1-9   100023234A4A
        .###########  |M 07LAL1-XXXX-N4-C1-3    100023242A5C
                        8LA4-034A-X01           8LW1-032A-X01
         .#########  |  07LAL2-XXXX-N2-C2-2    100023239A2D
                        100023243A5A            100023245W6A
                        100023251W5C            183027W1D
                        183028W4D               183041W6B
                        8LW3-041D-X01
    0         .##### S+  100023252W2B           183035A5D
                        183039W1A               8LW6-036A-X01
               .####  |S 100023237A3B           100023247W4C
                        183030W5B               183036A4B
                .###  |  07LAL1-XXXX-N1-C1-1    07LAL1-XXXX-N7-C1-6
                        07LAL1-XXXX-N8-C1-7     07LAL1-XXXX-N9-C1-8
                        100023238A5B            8LW5-042C-X01
   -1             .# T+  8LA2-035C-X01          8LW3-033B-X01
                  .  |T
                  .  |
   -2             .  +
                  .  |
                  .  |
   -3             .  +
                     |
                     |
   -4                +
                  .  |
                     |
   -5             .  +
               <less>|<frequ>
 EACH '#' IS 389.
```

Figure 9.2.3: Item Map LAL Grade 7

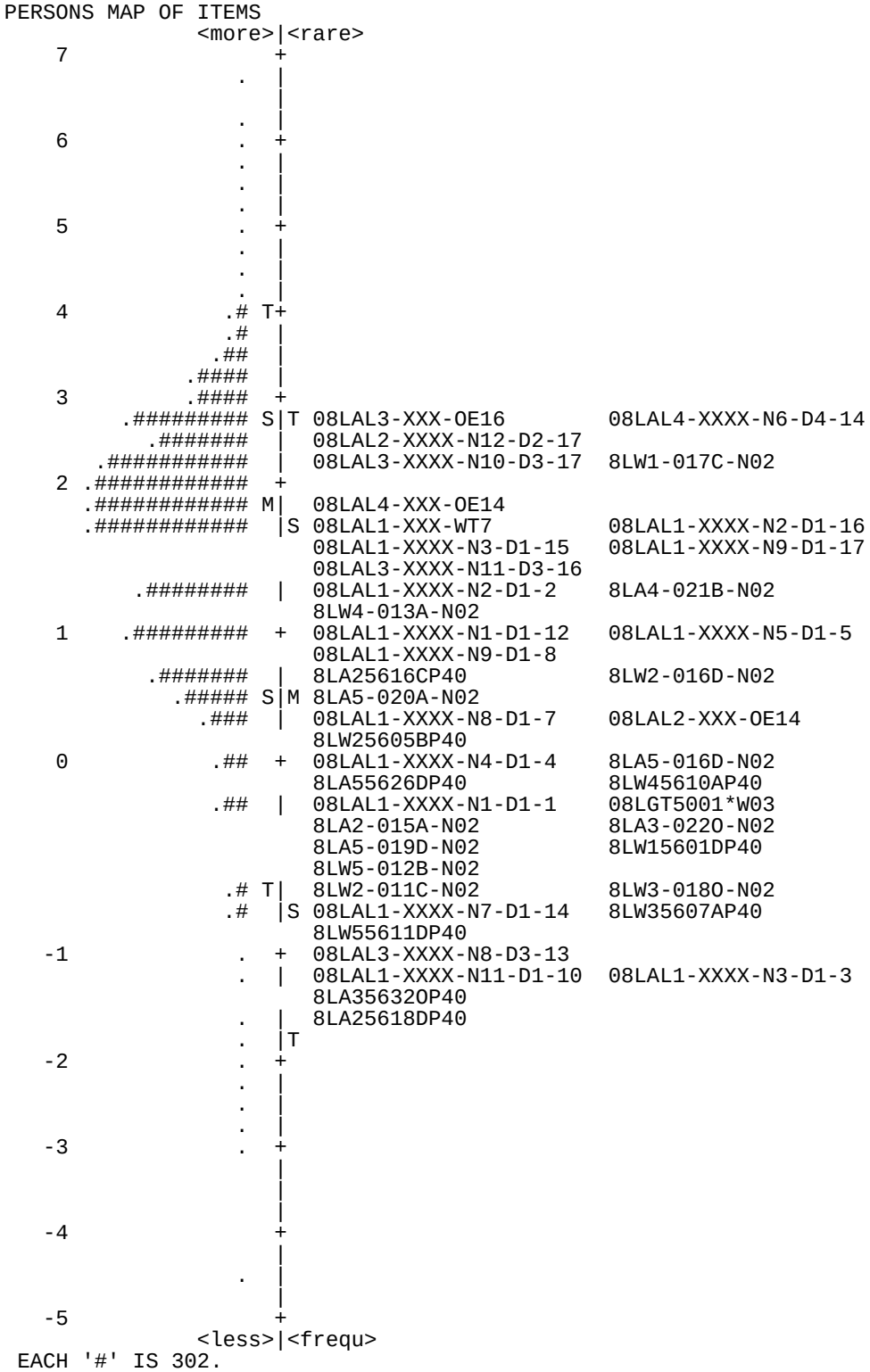


Figure 9.2.4: Item Map LAL Grade 8

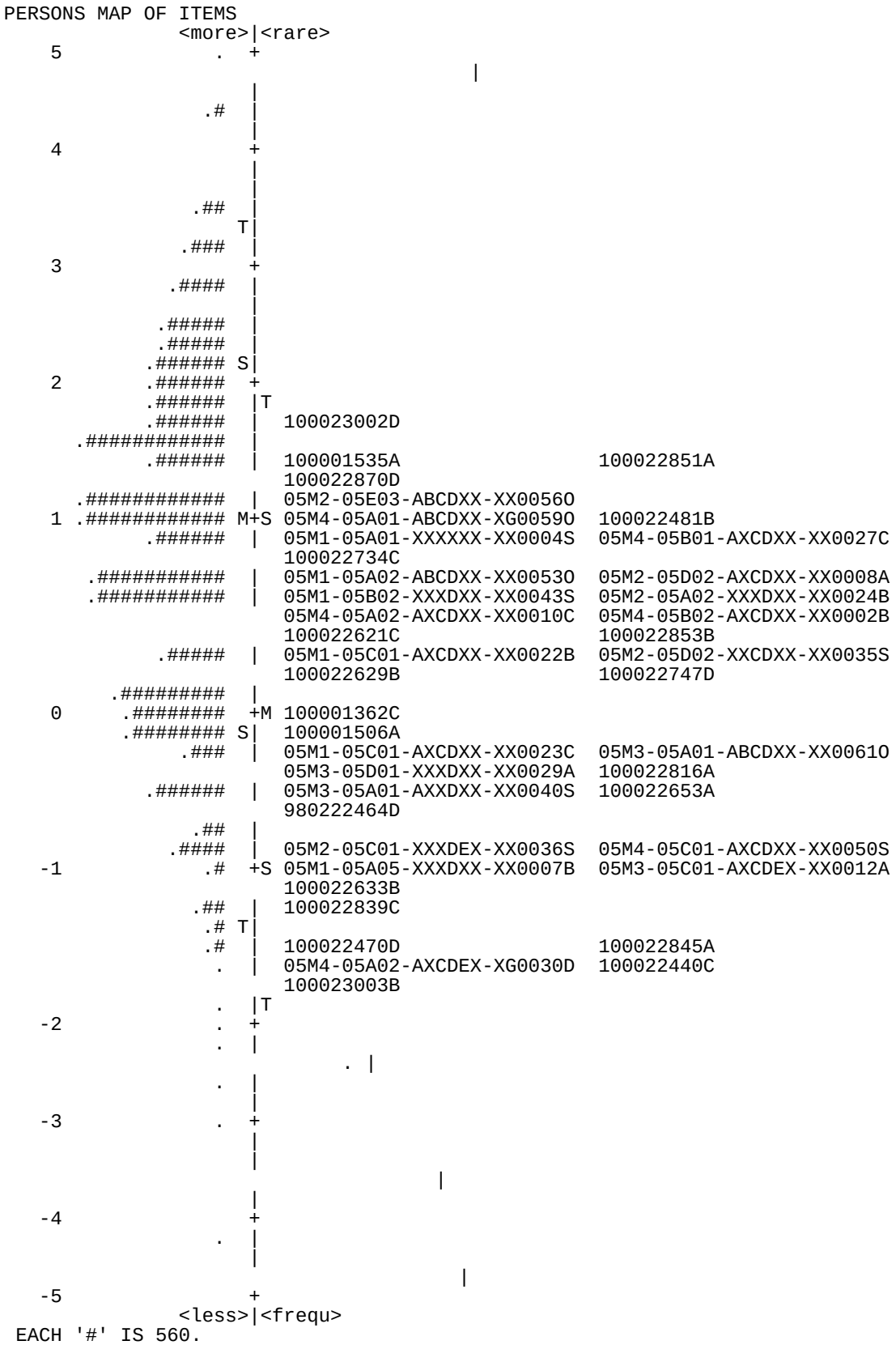


Figure 9.2.5: Item Map Math Grade 5

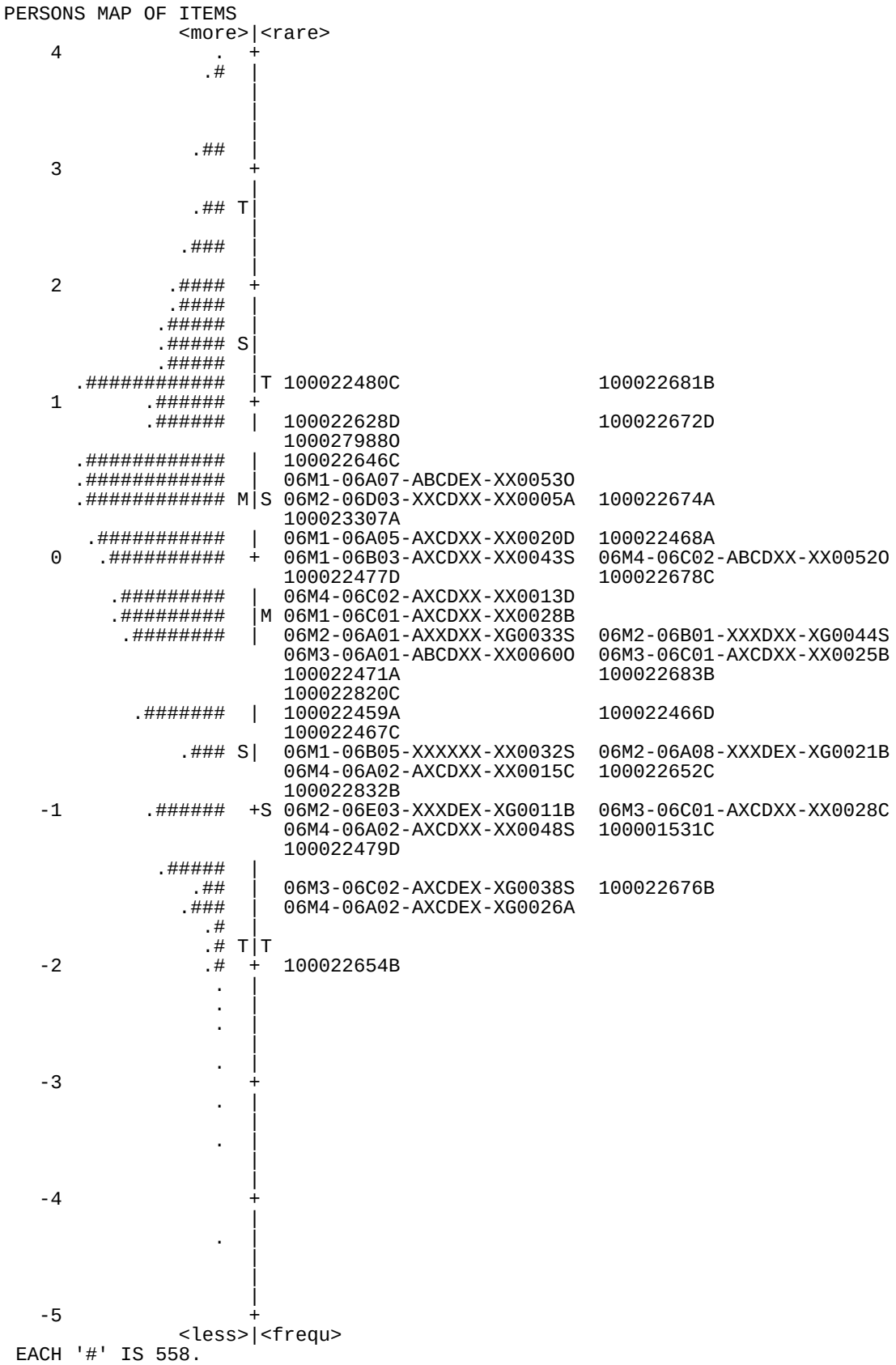


Figure 9.2.6: Item Map Math Grade 6

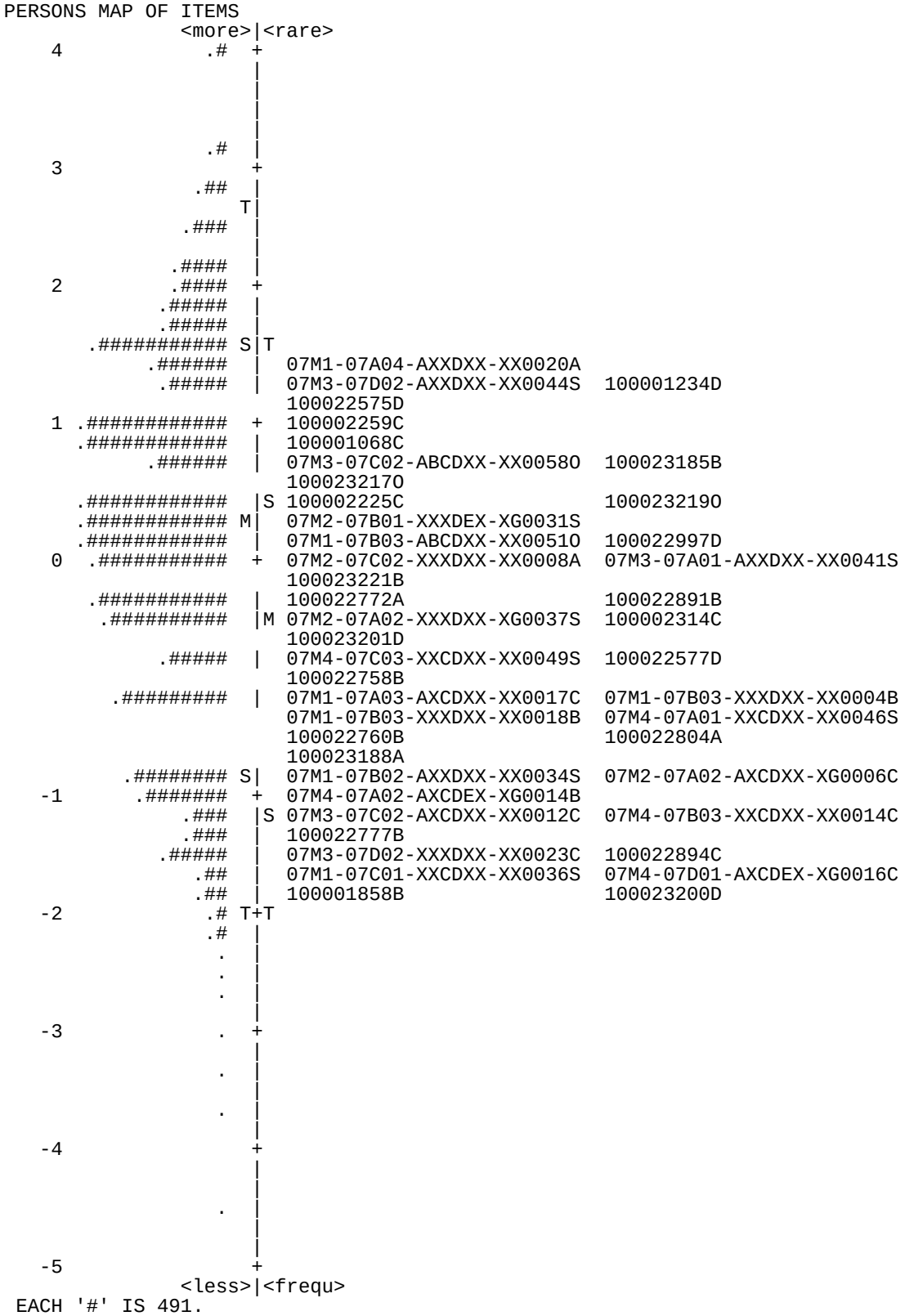


Figure 9.2.7: Item Map Math Grade 7

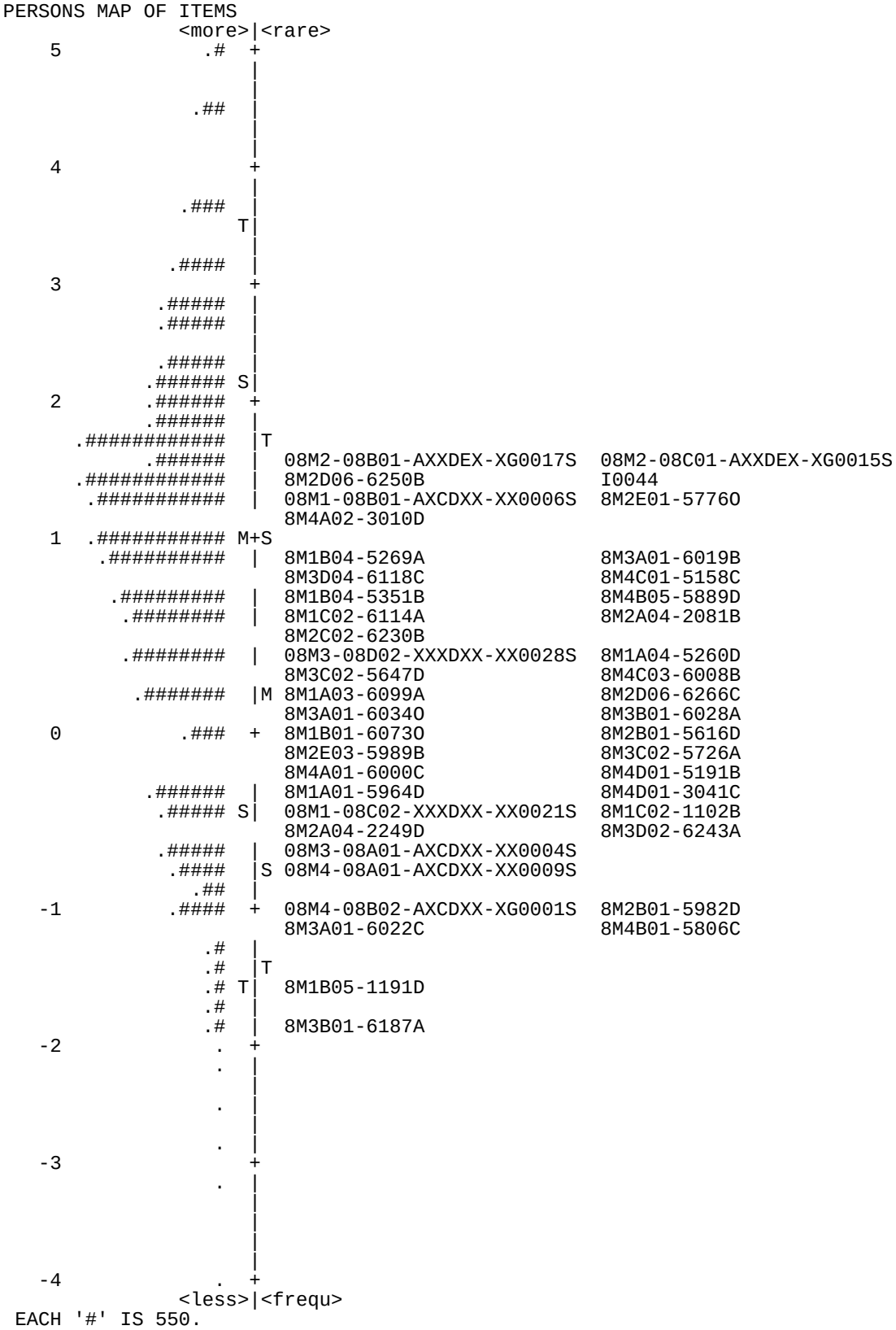


Figure 9.2.8: Item Map Math Grade 8

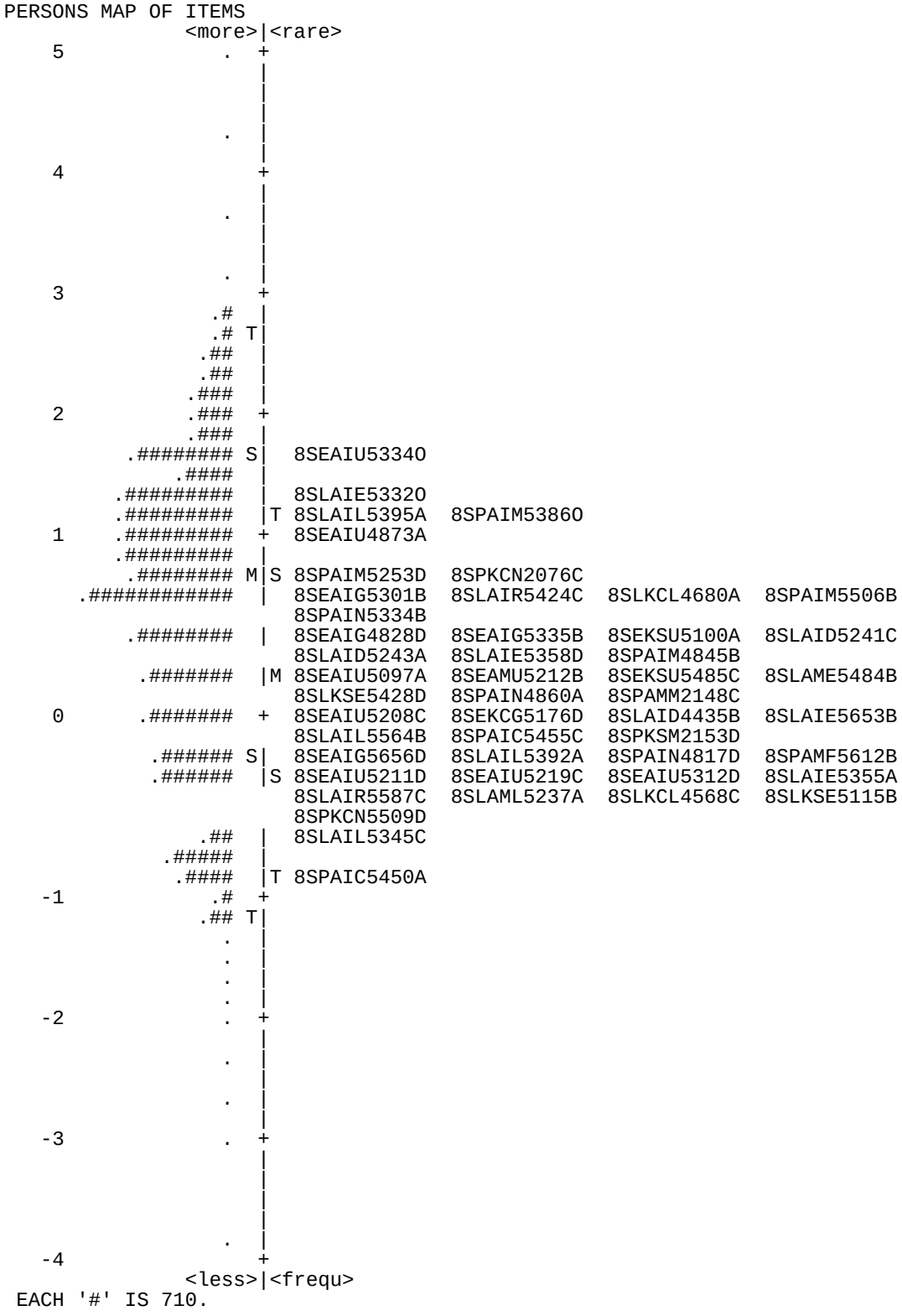


Figure 9.2.9: Item Map Science Grade 8

The test information function is another method of assessing the reliability or the precision of a test. The reliability of a test, however, is not uniform across the entire range of test scores. The highest and lowest scores typically have more measurement error than do scores in the middle of the range because more examinees tend to score in the middle of the score range. With item response theory (IRT) the item and test information functions can assess test reliability across the range of scores. The item information function is the probability of a correct response multiplied by the probability of an incorrect response. Item information functions (I_{ij}) for every item (j) at every level of student ability (i) can be calculated for each item using the following equation:

$$I_{ij}(\theta_i,\delta_j) = P_{ij}*(1-P_{ij})$$

The total test information function for a given ability level is simply the sum of all the item information functions for that ability level (Lord & Novick, 1968; Hambleton, 1989). Computing an item information function for each ability level and summing these functions to derive test information functions for each ability level, one can plot the total information function for a test, as shown in Figures 9.2.10 – 9.2.18. Each item yields the greatest amount of information (.25) at the point at which the difficulty of the item (δ_j) is equal to the ability of the student (θ_i).

These figures illustrate the level of information at theta values ranging from -4 to +4. As shown the information or reliability of the test scores are lower at the extremes and higher in the middle. More information implies less measurement error. Ideally, the Proficient cut score would occur at the peak of the information function where the most information occurs and the least measurement error. Thus, scores in this area yield the most error free measurements. As depicted in these figures, the Proficient cut scores for LAL, mathematics, and science all occur near the peak of information. In fact, the Proficient cut score for Grade 7 LAL occurs at exactly the peak of Grade 7 LAL TIF.

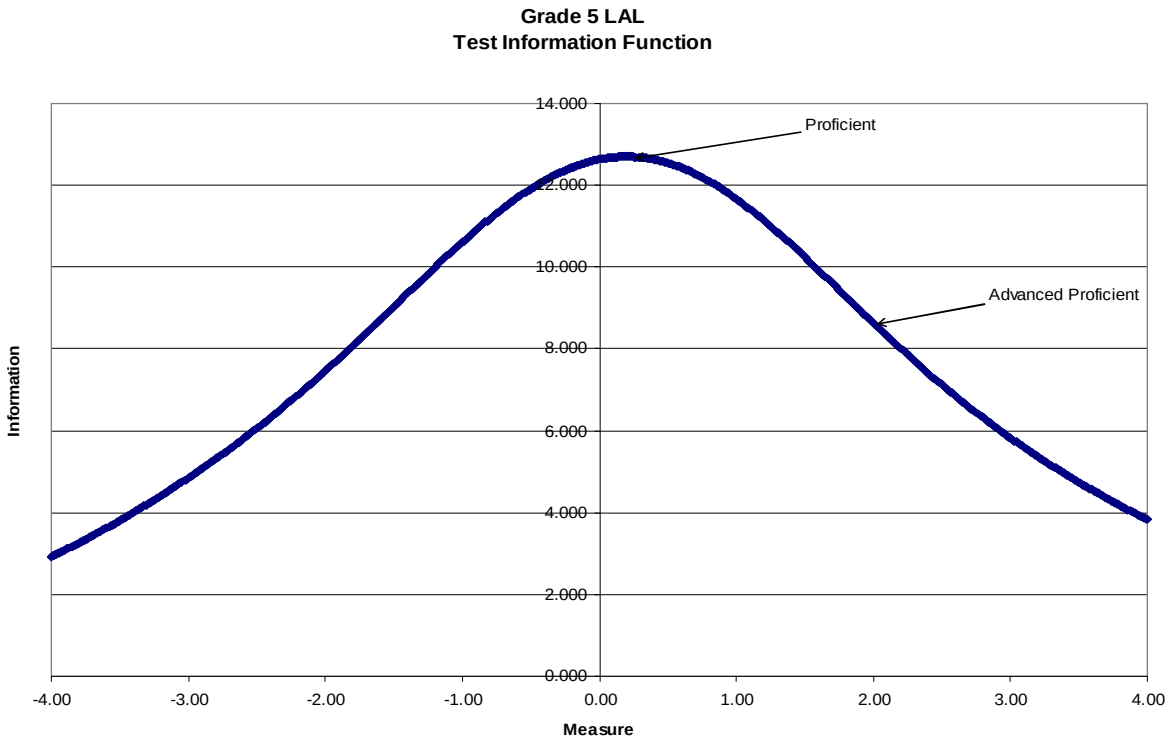


Figure 9.2.10: TIF LAL Grade 5

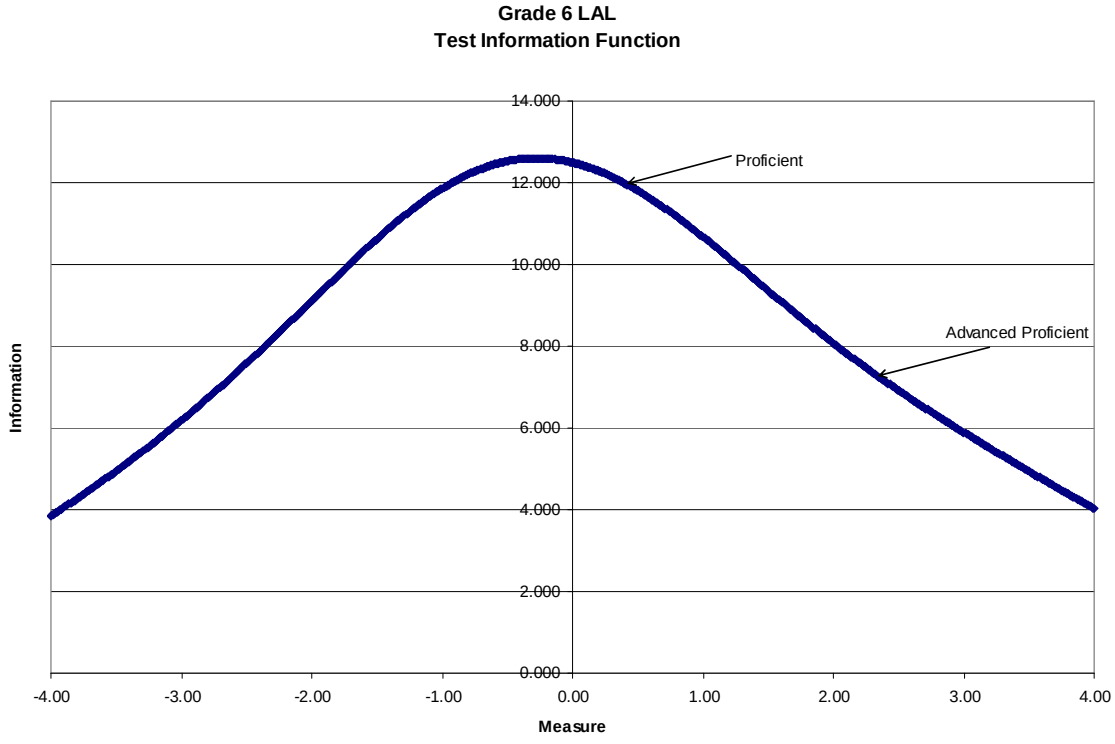


Figure 9.2.11: TIF LAL Grade 6

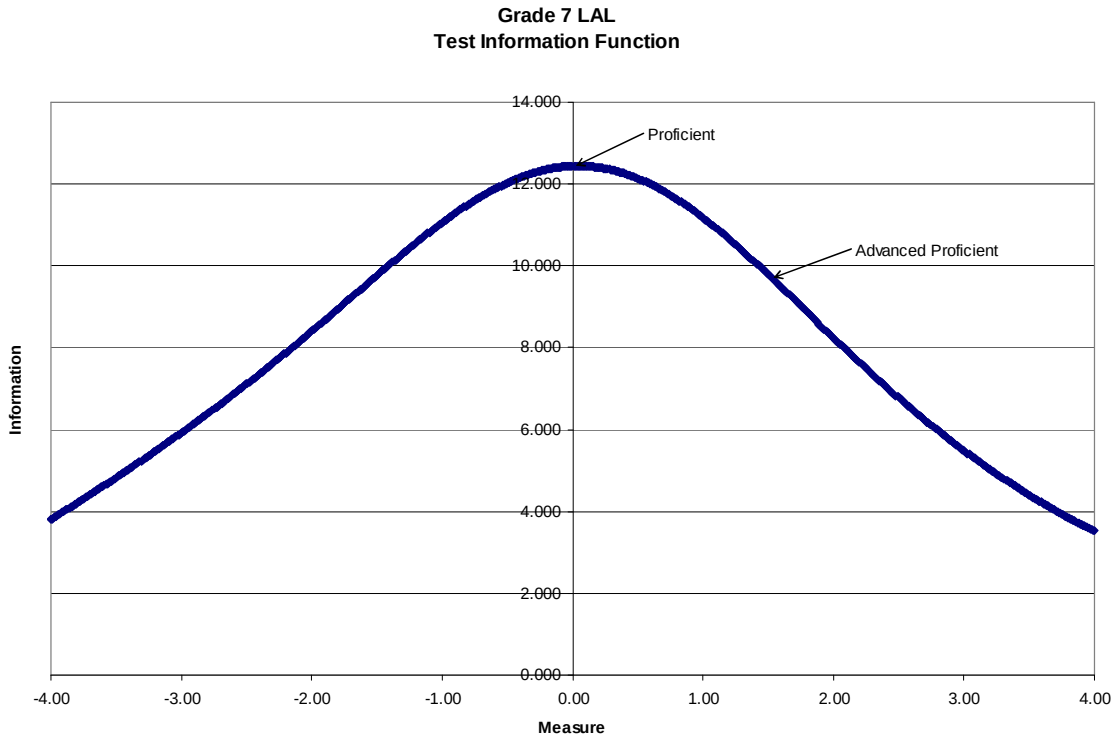


Figure 9.2.12: TIF LAL Grade 7

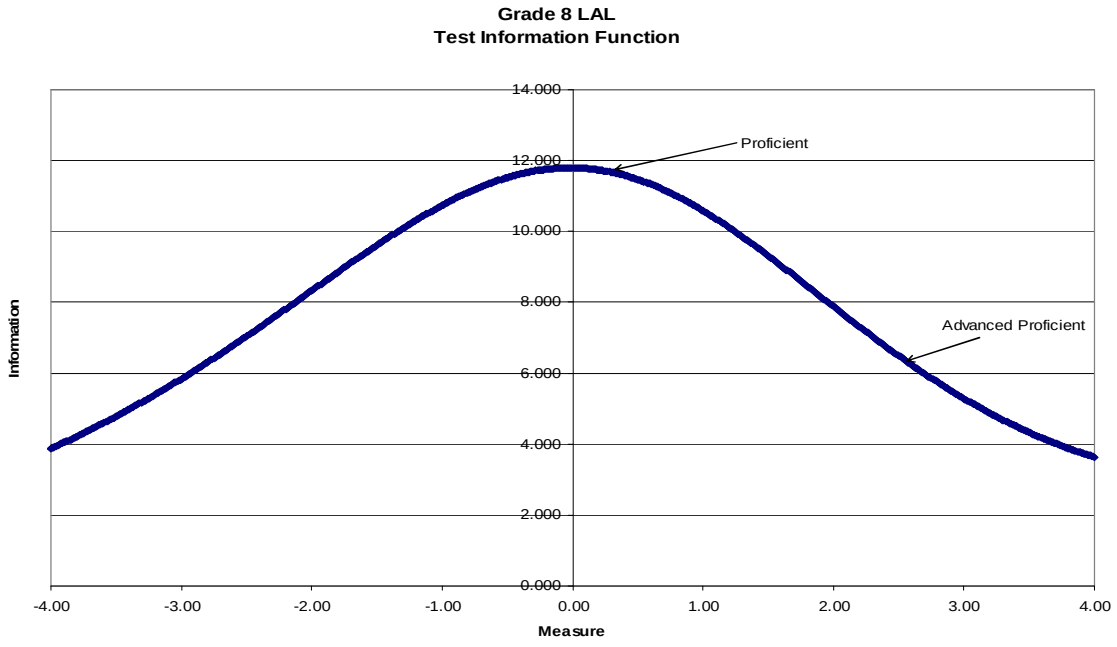


Figure 9.2.13: TIF LAL Grade 8

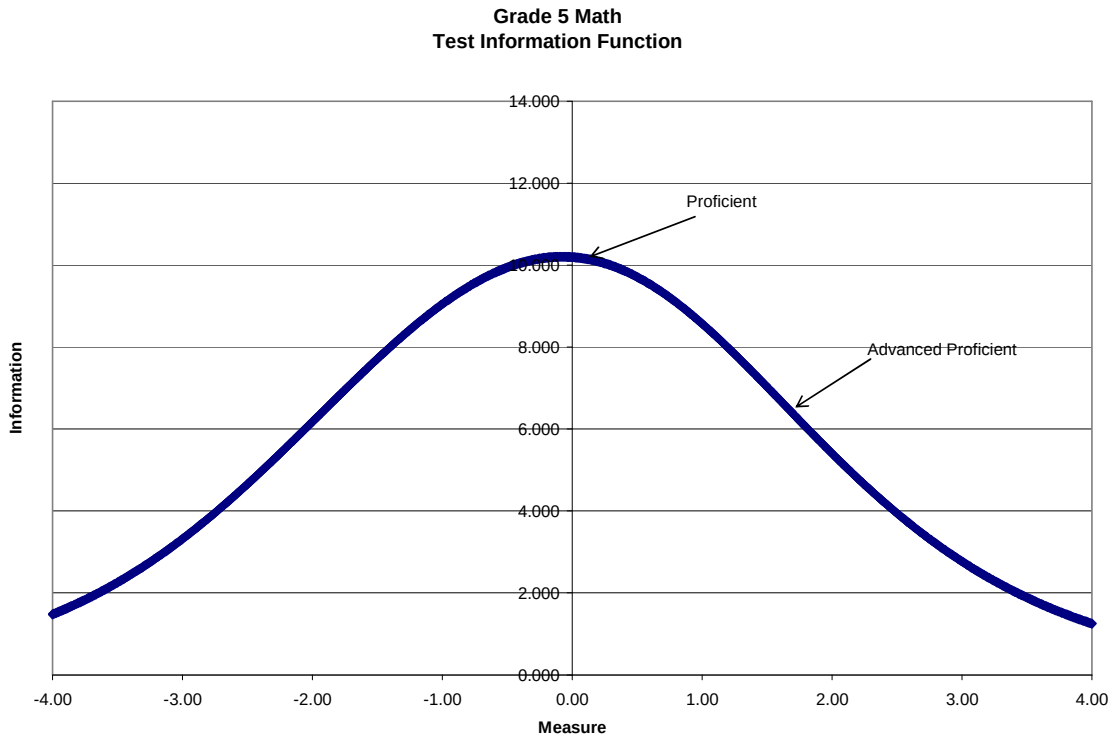


Figure 9.2.14: TIF Mathematics Grade 5

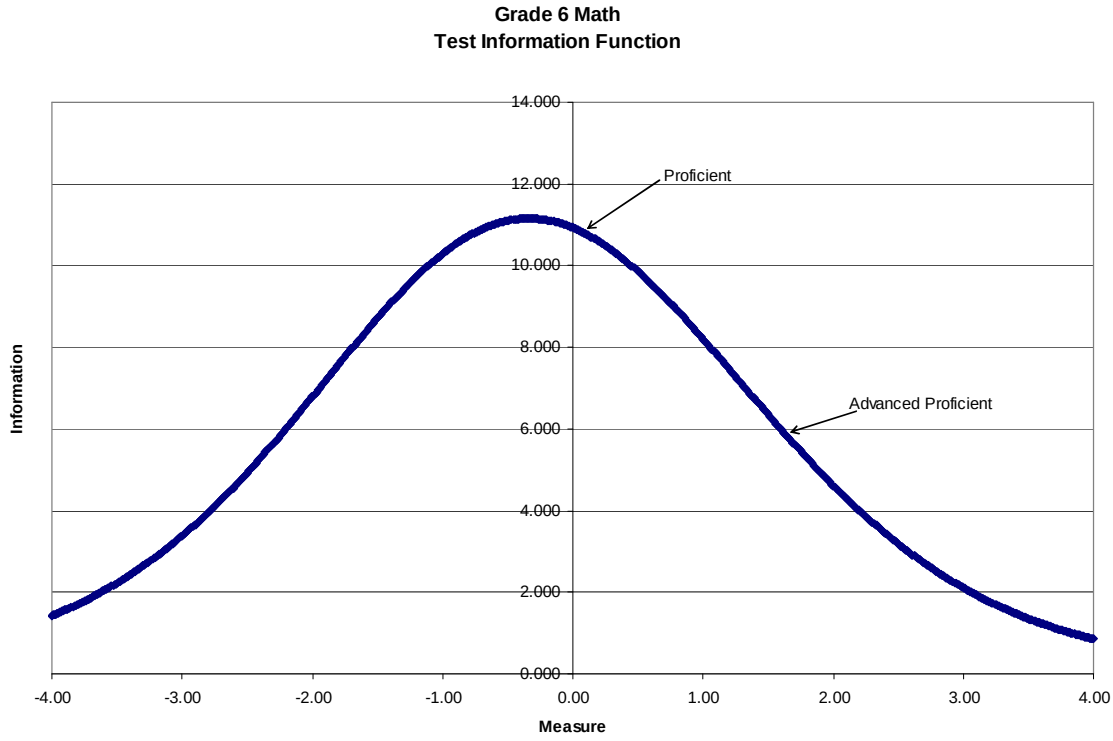


Figure 9.2.15: TIF Mathematics Grade 6

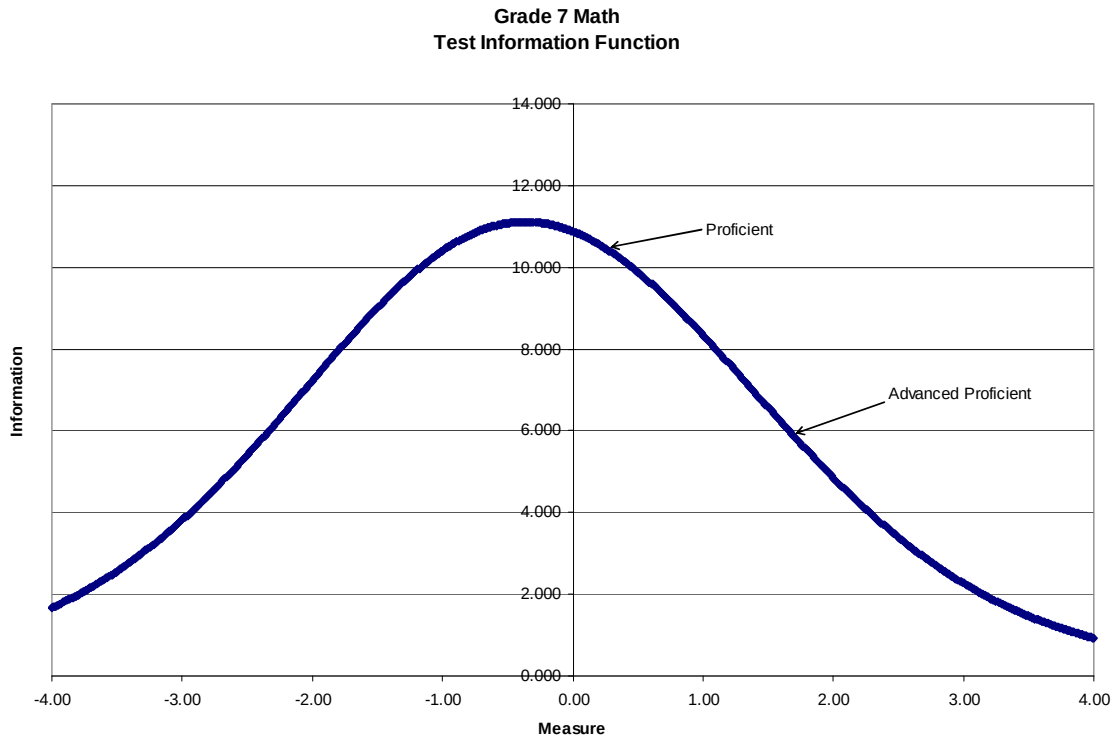


Figure 9.2.16: TIF Mathematics Grade 7

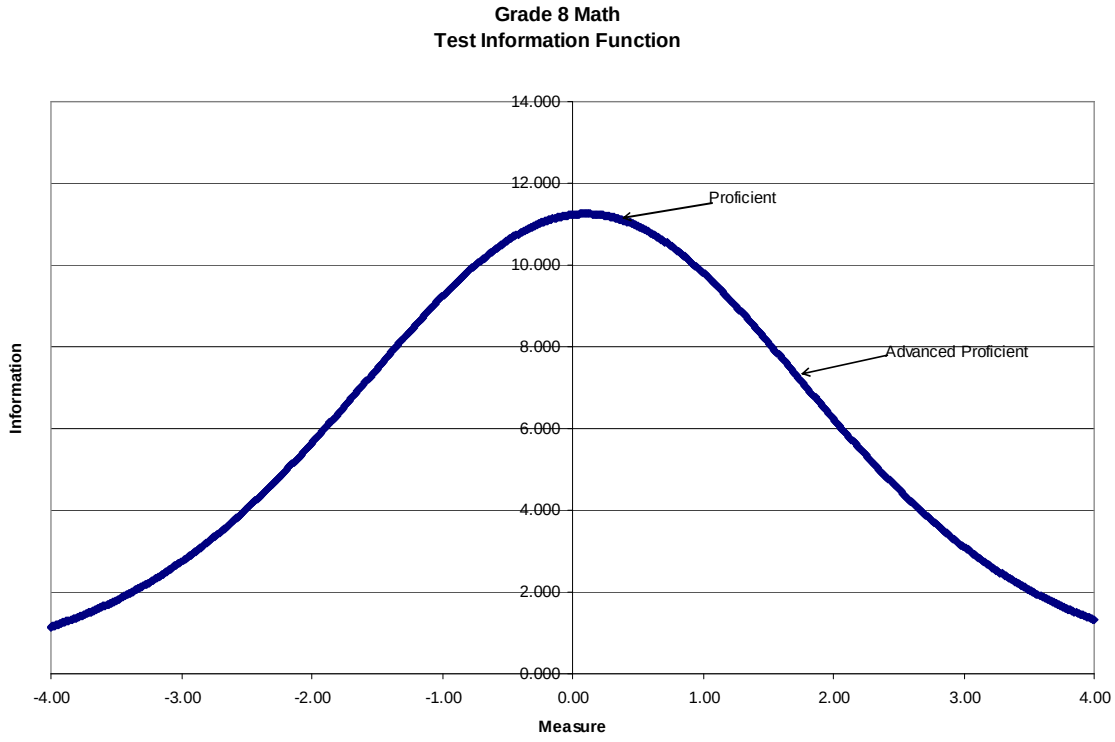


Figure 9.2.17: TIF Mathematics Grade 8

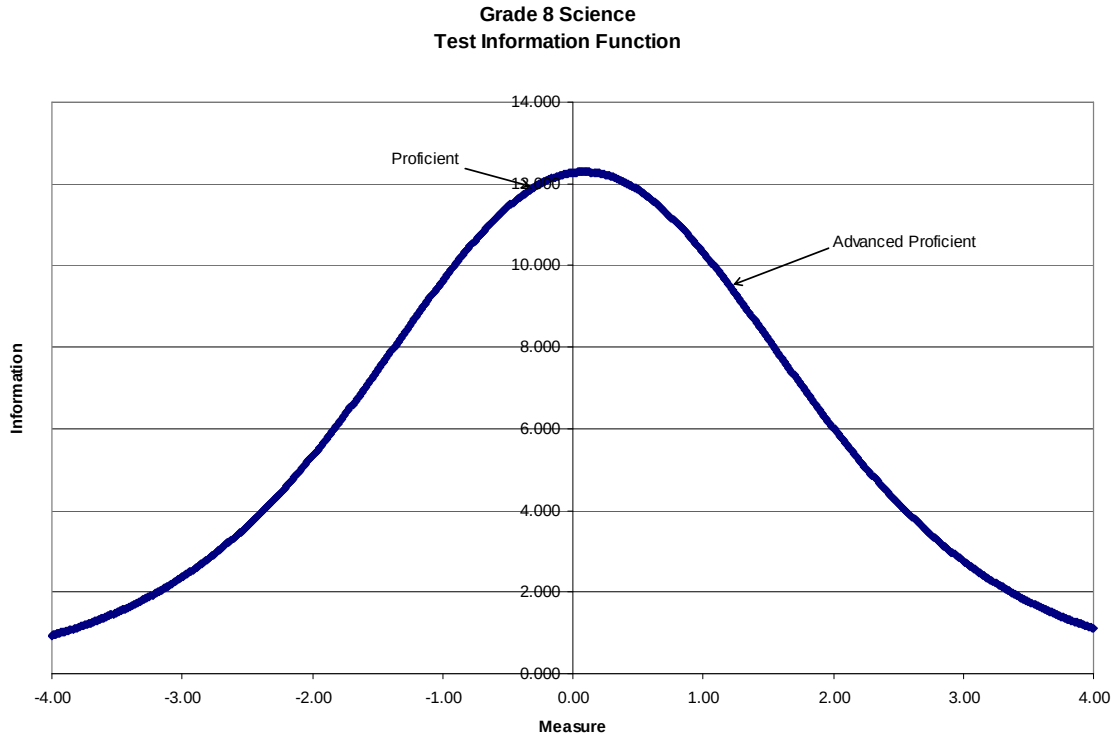


Figure 9.2.18: TIF Science Grade 8

9.3 Conditional Estimate of Error at Each Cut-Score

The 2008 NJ ASK grades 5, 6, 7, and 8 raw score cut scores and the corresponding conditional standard error of measurement (CSEM) are summarized in Table 9.3.1. WINTEPS calculates the standard error at each score point using item response theory and the information function. The equation for the standard error at each value of theta (ability) is given by

$$SE(\hat{\theta}) = \frac{1}{\sqrt{I(\theta)}}$$

where $I(\theta)$ is the information function for a test at θ. For the Rasch model, the information provided by a test at θ is the sum of the item information functions at θ. Interpolation of the raw cut scores were used to derive the CSEM from the standard error associated with the theta at each cut scores.

Table 9.3.1: Raw Score Cut Scores with Conditional Standard Error of Measurement by Content Area and Grade Level – 2008 NJ ASK Operational Forms

		LAL		Mathematics		Science	
		Proficient	Advanced Proficient	Proficient	Advanced Proficient	Proficient	Advanced Proficient
Grade 5	Cut score	40	57.5	25	40	N/A	
	(CSEM)	(2.49)	(1.92)	(3.22)	(2.76)		
Grade 6	Cut score	41.5	59	25	41		
	(CSEM)	(2.39)	(1.83)	(3.44)	(2.44)		
Grade 7	Cut score	39	55	27	27		
	(CSEM)	(2.51)	(2.18)	(3.33)	(3.33)		
Grade 8	Cut score	42.5	60	29	43	20	38
	(CSEM)	(2.34)	(1.50)	(3.43)	(2.69)	(3.41)	(3.35)

9.4 Rater Reliability

Tables 9.4.1, 9.4.2, 9.4.3, and 9.4.4 show the percentages of writing tasks and constructed-response items scored with exact agreement, adjacent agreement, and resolution needed by grade level and content area. The score rubrics used for raters had a score range of 0 to 5 for the grade 5 writing prompt, and 0 to 6 for the grade 6, 7, and 8 writing prompt. For grades 5 through 8, the *Persuasive* writing prompt scores were summed and the *Speculative* writing prompt scores were averaged in data analyses and score reporting. The rubrics had score points that ranged from 0 to 4 for the LAL CR items and from 0 to 3 for the mathematics and science CR items. There were no half points assigned for any of the CR items or the *Persuasive* writing prompt. Half points may result for the *Speculative* writing prompt, as scores from the two readers were averaged.

One hundred percent (100%) of the writing prompts were scored by two raters. Ten percent (10%) of the constructed-response items in all content areas were read by a second rater. The purpose of the second-reading for the constructed-response items was to investigate the consistency between raters for the 2008 NJ ASK. For grade 8 LAL, over 69% of the responses were assigned a score by a second rater that was in exact agreement with the first rater. Another 30% of the second ratings were assigned an adjacent score by a second rater. An adjacent score is a score assigned by the second rater that is no more than ±1 score point from the score assigned by the first rater. For grade 8 mathematics, over 89% of the responses were assigned a score by a second rater that was in exact agreement with the first rater. The exact agreement rate for grade 8 science was 86%. The agreement rates for grades 5, 6, and 7 were comparable or higher in LAL and mathematics.

Table 9.4.1: Grade 5 Consistency between Rater Scoring for the Writing Tasks and Constructed-Response Items

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
LAL All	**75.24**	**24.48**	**0.28**
Writing All	**70.64**	**28.93**	**0.43**
Writing Task 1	71.71	27.74	0.55
Writing Task 2	69.57	30.12	0.31
Reading All	**79.85**	**20.02**	**0.13**
CR 1	77.45	22.31	0.24
CR 2	75.56	24.19	0.25
CR 3	80.56	19.39	0.05
CR 4	79.28	20.6	0.13
CR 5	82.56	17.32	0.12
CR 6	83.67	16.32	0.01
Math All	**88.60**	**10.39**	**1.02**
ECR 1	87.95	10.46	1.59
ECR 2	84.43	13.60	1.97
ECR 3	92.12	7.55	0.33
ECR 4	89.89	9.93	0.18

Table 9.4.2: Grade 6 Consistency between Rater Scoring for the Writing Tasks and Constructed-Response Items

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
LAL All	**71.31**	**27.95**	**0.70**
Writing All	**64.02**	**34.72**	**1.27**
Writing Task 1	63.77	34.81	1.42
Writing Task 2	64.27	34.62	1.11
Reading All	**78.61**	**21.19**	**0.13**
CR 1	85.31	14.66	0.03
CR 2	84.02	15.89	0.08
CR 3	76.64	23.27	0.09
CR 4	79.42	20.53	0.05
CR 5	75.71	23.8	0.49
CR 6	70.54	28.98	0.04
Math All	**90.26**	**8.85**	**0.89**
ECR 1	91.81	7.27	0.92
ECR 2	88.12	11.38	0.50
ECR 3	90.26	8.99	0.75
ECR 4	90.84	7.76	1.40

Table 9.4.3: Grade 7 Consistency between Rater Scoring for the Writing Tasks and Constructed-Response Items

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
LAL All	**63.55**	**34.76**	**1.27**
Writing All	**59.88**	**37.83**	**2.30**
Writing Task 1	57.41	39.55	3.04
Writing Task 2	62.34	36.11	1.55
Reading All	**67.23**	**31.70**	**0.24**
CR 1	71.36	28.17	0.03
CR 2	68.52	30.85	0.63
CR 3	69.71	29.78	0.51
CR 4	71.89	27.68	0.04
CR 5	61.42	36.27	0.09
CR 6	60.48	37.43	0.16
Math All	**91.48**	**7.97**	**0.56**
ECR 1	92.58	7.17	0.25
ECR 2	90.28	9.01	0.72
ECR 3	91.71	7.51	0.78
ECR 4	91.36	8.17	0.47

Table 9.4.4: Grade 8 Consistency between Rater Scoring for the Writing Tasks and Constructed-Response Items

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
LAL All	**69.23**	**30.15**	**0.62**
Writing All	**67.59**	**31.63**	**0.79**
Writing Task 1	63.43	35.33	1.25
Writing Task 2	71.75	27.93	0.32
Reading All	**70.88**	**28.68**	**0.45**
CR 1	72.14	27.55	0.31
CR 2	71.54	28.05	0.41
CR 3	76.33	23.28	0.39
CR 4	70.41	28.91	0.68
CR 5	70.92	28.85	0.23
CR 6	63.91	35.42	0.66
Math All	**89.08**	**9.89**	**1.03**
ECR 1	85.51	13.80	0.69
ECR 2	95.80	3.26	0.93
ECR 3	86.72	12.13	1.15
ECR 4	88.27	10.37	1.36

Table 9.4.4 (continued): Grade 8 Consistency between Rater Scoring for the Writing Tasks and Constructed-Response Items

	% Raters in Exact Agreement	% Raters in Adjacent Agreement	% Resolution Needed
Science All	**86.09**	**12.88**	**1.03**
CR 1	90.38	8.99	0.63
CR 2	77.88	21.05	1.07
CR 3	90.01	8.60	1.39

PART 10: VALIDITY

The *Standards for Educational and Psychological Testing* states, "Ultimately, the validity of an intended interpretation of test scores relies on all the available evidence relevant to the technical quality of a testing program. This includes evidence of careful test construction; adequate score reliability; appropriate test administration and scoring; accurate score scaling, equating, and standard setting; and careful attention to fairness for all examinees," (page 17).[23] While this section summarizes evidence supporting claims as to the validity of NJ ASK performance scores, many parts of this technical report provide appropriate evidence for validity. Given the procedural and empirical evidence available and the rationale presented below, valid performance standards-based interpretations and uses of the scores are generally supported.

The following begins with a review of important federal statutes requiring the NJ ASK 5–8 and goes on to explain the purposes and intended uses of performance test scores, suggesting the value implications of performance scores for schools, teachers, students, and parents. Content-related evidence supporting validity is presented in terms of the adequacy and appropriateness of the state content standards and the representation of the content standards on the tests. Then, validity evidence based on the internal structure of NJ ASK is provided through a correlational analysis of NJ ASK content clusters with each other. Reference to specific Standards within the *Standards for Educational and Psychological Testing* are provided where appropriate.

10.1 Content and Curricular Validity[24]

Baker and Linn (2002)[25] suggest that "Two questions are central in the evaluation of content aspects of validity. Is the definition of the content domain to be assessed adequate and appropriate? Does the test provide an adequate representation of the content domain the test is intended to measure?" (p. 6). The following two sections help answer these two very important questions and also address Standard 1.6 of the *Standards for Educational and Psychological Testing*.

Appropriateness of Content Definition

In 1996, the New Jersey State Board of Education adopted the New Jersey Core Curriculum Content Standards, an ambitious framework for educational reform in the State's public schools. New Jersey's standards were created to improve student achievement by clearly defining what all students should know and be able to do at the end of thirteen years of public education. Since the adoption of those standards, the NJ DOE has continuously engaged in discussion with educators, business representatives, and national experts about the impact of the standards on classroom

[23] American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. (1999). *Standards for Educational and Psychological Testing*. Washington: APA.

[24] Standard 1.6 – When the validation rests in part on the appropriateness of test content, the procedures followed in specifying and generating test content should be described and justified in reference to the construct the test is intended to measure or the domain it is intended to represent. If the definition of the content sampled incorporates criteria such as importance, frequency, or criticality, these criteria should also be clearly explained and justified (page 18).

[25] Baker, E. L., & Linn, R. L. (2002). Validity Issues for Accountability Systems. Center for the Study of Evaluation. Technical Report 585, Los Angeles, CA.

practices. To assist teachers and curriculum specialists in aligning curriculum with the standards, the NJ DOE provided local school districts with a curriculum framework for each content area. The frameworks provided classroom teachers and curriculum specialists with sample teaching strategies, adaptations, and background information relevant to each of the content areas.

The State Board wisely required that the standards be reviewed and revised every five years. The review process, begun in May 2001, involved teachers, school administrators, students, parents, and representatives from business, higher education, and the community. In addition, several content areas were reviewed by Achieve, Inc., and the Council of Chief State School Officers (CCSSO). In response to this unprecedented review, the 2004 New Jersey Core Curriculum Content Standards provide the level of specificity and depth of content that will better prepare students for post secondary education and employment. The standards are based on the latest research in each of the content areas and identify the essential core of learning for all students.

Since the adoption of the original 1996 New Jersey Core Curriculum Content Standards (CCCS), the New Jersey State Board of Education approved administrative code that implements all aspects of standards-based reform. N.J.A.C. 6A:8 requires districts to align all curriculum to the standards; ensure that teachers provide instruction according to the standards; ensure student performance is assessed in each content area; and provide teachers with opportunities for professional development that focuses on the standards.

Adequacy of Content Representation

Adequacy of the content representation of the NJ ASK is critically important because the tests must provide an indication of student progress toward achieving the knowledge and skills identified in the CCCS, and the tests must fulfill the requirements under NCLB.

Adequate representation of the content domains defined in the CCCS is assured through use of a test blueprint and a responsible test construction process. New Jersey performance standards, as well as the CCCS, are taken into consideration in the writing of multiple-choice and constructed-response items and constructed-response rubric development. Each test must align with and proportionally represent the sub domains of the test blueprint. Evidence to support the above was given in Part 2, Test Development Process, and Part 7, Item and Test Statistics. Tables 2.1.3 through 2.1.13 in Part 2 provide a comparison of target test construction maps to actual test maps for LAL, mathematics, and science. Inspection of these tables confirms that the target number of items for each sub domain was achieved.

MI strives to equitably represent the CCCS on each test by balancing sub-domain coverage on each test, by proportionally representing items corresponding to Partially Proficient, Proficient, and Advanced Proficient performance categories on each test, and by matching item format to the requirements of the content and standards descriptions.

10.2 Construct Validity[26]

Because the NJ ASK testing program assesses student performance in several content areas using a variety of testing methods, it is important to study the pattern of relationships among the content areas and testing methods. Therefore, this section addresses evidence based on responses and internal structure. One method for studying patterns of relationships to provide evidence supporting the inferences made from test scores is the multi-trait matrix. Tables 7.3.1 through 7.3.4 summarize Pearson correlation coefficients among test content domains and clusters by grade level. The correlations between clusters within a content area were generally found to be higher than the correlations between clusters across the content areas.

NJ ASK Test Scores

The NJ ASK 5–8 are scaled in several ways: raw score points, Item Response Theory (IRT), and performance standard level (based on scale-score cuts). New Jersey actively promotes the use of performance level results, reporting them annually on each content test at the student, school, district and state levels. Individual student and average scale scores are also used, but should play a secondary role, generally interpreted with reference to their distance from performance-score cut points. Test results are reported for students as a whole as well as by student group including sex, ethnicity, disability, English language proficiency, migrant status, and DFG. Scores are reported to schools and districts in the annually published reports (see Part 11: Reporting).

NJ ASK performance scores indicate that an individual student performs at the Partially Proficient, Proficient, and Advanced Proficient level in a content area. Performance standard descriptions associated with each level provide details of the performance that students have met or exceeded. No stakes for students or teachers are attached by the state to student-level scores. Teachers are counseled to interpret individual student scores only in the context of other assessment results and their own experience.

10.3 Criterion-Related Validity

Validity evidence related to other Standards is listed below:

Standard 1.5[27]

- The composition of the sample of examinees from which validity evidence was obtained is described in detail in Part 7 – Item and Test Statistics, including major relevant sociodemographic characteristics. This information is imbedded within the Tables of Part 7. These tables also provide descriptive statistics for number correct raw score and for

[26] Standard 1.11 – If the rationale for a test use or interpretation depends on premises about the relationships among parts of the test, evidence concerning the internal structure of the test should be provided.
Standard 1.12 – When interpretation of subscores, score differences, or profiles is suggested, the rationale and relative evidence in support of such interpretation should be provided. Where composite scores are developed, the basis and rationale for arriving at the composites should be given.

[27] Standard 1.5 - The composition of any sample of examinees from which validity evidence is obtained should be described in as much detail as is practical, including major relevant sociodemographic and developmental characteristics.

scale scores. Statistics include N-counts, means, standard deviations, minimum and maximum values, and a variety of data disaggregations, including student demographic group and DFG.

Standard 1.7[28]

- Standard setting procedures, including the selection process and the characteristics of judges, is described in detail in Part 6.
- The 2008 NJ ASK 5-8 constructed-response items and writing responses required hand scoring by Measurement Incorporated (MI) personnel. The processes of selecting and training scorers, reading and scoring papers, and monitoring scoring are described in detail in Part 5.

Standard 1.13[29]

- The conditions under which the data were collected are described in Part 2. Information about the administration of NJ ASK is available in the *New Jersey Assessment of Skills & Knowledge Spring 2008 Test Coordinator Manual Grades 5–8***.**

[28] Standard 1.7 – When a validation rests in part on the opinions or decisions of expert judges, observers, or raters, procedures for selecting such experts and for eliciting judgments or ratings should be fully described. The qualifications, and experience, of the judges should be presented. The description of procedures should include any training and instructions provided, should indicate whether participants reached their decisions independently, and should report the level of agreement reached. If participants interacted with one another or exchanged information, the procedures through which they may have influenced one another should be set forth.

[29] Standard 1.13 - When validity evidence includes statistical analyses of test results, either alone or together with data on other variables, the conditions under which the data were collected should be described in enough detail that users can judge the relevance of the statistical findings to local conditions. Attention should be drawn to any features of a validation data collection that are likely to differ from typical operational testing conditions and that could plausibly influence test performance.

PART 11: REPORTING

Scores are reported in two cycles. Data for Cycle I reporting are produced after record changes are submitted by districts. Data for Cycle II reporting are produced after the completion of automatic rescoring of the constructed-response items and writing tasks. Cycle I data are considered preliminary.

11.1 Cycle I Reports

The Cycle I reports included the following, separate for each grade:

- Student Sticker (1 per student)
- Individual Student Report (ISR) (2 per student)
- Student Roster – Science (Grade 8 only)
- Student Roster – Mathematics
- Student Roster – Language Arts Literacy
- All Sections Roster
- Preliminary Performance by Demographic Group –School
- Preliminary Performance by Demographic Group –District
- Preliminary Cluster Means Report

Each Cycle I report is briefly described below.

Student Stickers

The Student Stickers (Figure 11.1.1) are sorted and printed by grade and alphabetically by last name. Stickers for students who are designated Out-of-District or Out-of-Residence, however, appear at the end of each grade. For these students, a sticker is sent to both the sending and the receiving school. One sticker for each student within the school is provided. It is a peel off label, designed to be easily attached to the student's permanent record.

Each sticker is divided into three sections:

1. The top section includes the names and codes of the county, district, and school.

2. The middle section contains student-specific identifying information, including:

• Name	• NJ ASK ID number	• State student ID (SSID)
• Grade	• Date of birth (DOB)	• Gender (Sex)
• LEP status	• Special education (SE) status	• Title I (T-I) status
• APA classification	• District/School ID number	

3. The bottom section displays the student's scale score in each of the content areas, along with the associated proficiency level. If a student did not receive a scale score for any reason, such reason will be noted here.

Figure 11.1.1 – Sample Student Stickers

Individual Student Report

The Individual Student Report (ISR) is a two-sided report, produced in grade and alphabetical sequence for students within the school. The ISR is divided into three sections; with demographic information appearing in the first section, followed by a summary of the student's overall performance in the second section. The third section, appearing on page two, provides the cluster scores. A sample ISR is show in Figure 11.1.2 (front page) and Figure 11.1.3 (back page). Two copies of this report are produced for every student tested, one for the student's permanent folder,

and the other for the student's parent/guardian to be shared in a manner determined by the local district.

The second section, Overall Performance, provides a summary explanation of the scale score and proficiency level meaning as well as a table indicating the student's scale score and proficiency level for each applicable content area. For comparison purposes, the table also offers the statewide scale score mean (i.e., the average scale score for all New Jersey students taking the NJ ASK) for each content area. In addition, the table presents a brief description of the skills each content area test measures.

On the back of the ISR is the third section, "Cluster Scores." Here the ISR provides a skill-specific view of a student's performance in each content area. This section presents a breakdown of raw score points earned and total points possible for each content area cluster and by item type (i.e., multiple-choice and constructed response questions). Note that not all clusters can be assumed to be of equal difficulty level; consequently, comparing one cluster score to another is not a meaningful analysis.

New Jersey Assessment of Skills and Knowledge
Individual Student Report

TEST DATE: SPRING 2008

REPORT PRINTED: 8/20/2008

Student/School Information

FRIEDMAN, JANICE

State Student ID:

NJ ASK ID Number:

Local District/School ID Number:

Answer Folder Number: 8142869

Date of Birth: 07/02/94

Grade: 8 Sex: F

Your child has Special Education (SE) code B - Other Health Impaired.

Your child attends:

COUNTY: 88 ANY COUNTY

DISTRICT: 7777 ANY DISTRICT

SCHOOL: 666 ANY SCHOOL

Overall Performance

This report contains information from the Spring 2008 administration of the New Jersey Assessment of Skills and Knowledge (NJ ASK) Grade 8. This test is designed to measure achievement of the New Jersey Core Curriculum Content Standards (CCCS) for Language Arts Literacy, Mathematics, and Science.

In 2008, the State Board of Education established higher levels of expectations for student achievement on the NJ ASK for grades 5-8. Students now have to earn at least 50% of the possible points on the test in order to be deemed proficient in Language Arts Literacy and Mathematics; previously, at most grade levels they could be deemed proficient having earned fewer than 50% of the possible points. Higher standards in the earlier grades will ensure that students enter 9th grade better prepared for the demands of high school, postsecondary education, and careers.

In this report, you will find:

- Your child's overall score and overall proficiency level in Language Arts Literacy, Mathematics, and Science
- Your child's performance in each of the clusters on the tests: A cluster is a set of knowledge and skills within each subject.

About Scale Scores and Proficiency Levels

A scale score is a common measure of achievement in a subject area at a grade level across years, districts, and schools. Your child's scale scores on the NJ ASK are presented below. The scale scores are based on the number of correct answers to multiple-choice questions and the number of points earned for responses to constructed response items and the writing tasks.

The possible scale scores for each subject are 100 to 300. If the scale score is below 200, your child scored "Partially Proficient" in that subject. If the scale score is between 200 and 249, your child scored "Proficient" in that subject. If the scale score is at or above 250, your child scored "Advanced Proficient" in that subject. The Scale Score Mean allows you to compare your child's score with that of other children throughout the state.

For more information on state assessments, consult the NJ DOE website: http://www.nj.gov/education/assessment/.

Subject	Your Child's Scale Score	Your Child's Proficiency Level			Description	Statewide Scale Score Mean
		Partially Proficient (100 - 199)	Proficient (200 - 249)	Advanced Proficient (250 - 300)		
Language Arts Literacy	199	✔			The Language Arts Literacy test measures reading comprehension and writing skills.	219.9
Mathematics	155	✔			The Mathematics test measures knowledge and skills in areas such as numerical operations, geometry, probability, data analysis, and patterns and algebra.	217.2
Science	222		✔		The Science test measures the student's ability to recall information and solve problems by applying science concepts in the Life, Physical, and Earth Sciences.	232.6

Figure 11.1.2: Individual Student Report (front)

Cluster Information

About Cluster Information
The tables on this page show how your child performed on each cluster in Language Arts Literacy, Mathematics, and Science. For each cluster, the tables show the number of points earned by your child out of the total number of points possible. The points needed to be proficient and the points needed to be advanced proficient are also shown for each test. The tables also show subtotals in each subject for multiple-choice questions and questions requiring a written response (constructed response). Your child's total raw scores for each subject are converted to the scale scores shown on the previous page. If your child did not receive a scale score in a subject, no data will appear in that table.

Language Arts Literacy

Cluster	Your Child's Points	Total Points Possible	Points Needed to be Proficient	Points Needed to be Adv. Proficient
Writing	7.0	18.0		
Persuasive	*4.0*	*12.0*		
Speculative	*3.0*	*6.0*		
Reading	35.0	60.0		
Working with Text	*19.0*	*30.0*		
Analyzing Text	*16.0*	*30.0*		
Total Points	**42.0**	**78.0**	**42.5**	**60.0**
Multiple Choice	24.0	36.0		
Constructed Response *	18.0	42.0		

Mathematics

Cluster	Your Child's Points	Total Points Possible	Points Needed to be Proficient	Points Needed to be Adv. Proficient
Number & Numerical Operations	5.0	13.0		
Geometry & Measurement	3.0	13.0		
Patterns & Algebra	3.0	13.0		
Data Analysis, Probability & Discrete Mathematics	4.0	13.0		
Problem Solving	*8.0*	*37.0*		
Total Points	**15.0**	**52.0**	**29.0**	**43.0**
Multiple Choice	12.0	32.0		
Constructed Response	3.0	20.0		

Science

Cluster	Your Child's Points	Total Points Possible	Points Needed to be Proficient	Points Needed to be Adv. Proficient
Life Science	9.0	22.0		
Physical Science	11.0	17.0		
Earth Science	8.0	18.0		
Knowledge	*7.0*	*9.0*		
Application	*21.0*	*48.0*		
Total Points	**28.0**	**57.0**	**20.0**	**38.0**
Multiple Choice	27.0	45.0		
Constructed Response	1.0	12.0		

The Language Arts Literacy Writing cluster consists of two types of writing tasks or prompts. The persuasive prompt requires the students to compose an essay that develops a point of view about the topic presented. The speculative prompt presents students with a situation to which they are asked to respond with a narrative story, actual or fictional.

The Reading cluster targets two skill areas, Working with Text and Analyzing Text. Working with Text involves interpretive strategies such as recognizing the central theme, recognizing supporting details, and paraphrasing or retelling. Analyzing Text involves evaluative strategies such as critiquing text, forming judgments, drawing conclusions, and understanding textual conventions used by the author. There are two types of reading passages, narrative and informational.

The Mathematics test measures knowledge and skills in four clusters. Some mathematics questions are also classified as Problem Solving because they require multiple steps and reasoning.

Science consists of three clusters: Life, Physical, and Earth science. In addition, Knowledge focuses on comprehension, society, and technology. Science questions may also be classified as Application when they assess the student's inquiry skills, habits of mind, and mathematics skills.

* Includes Writing Tasks

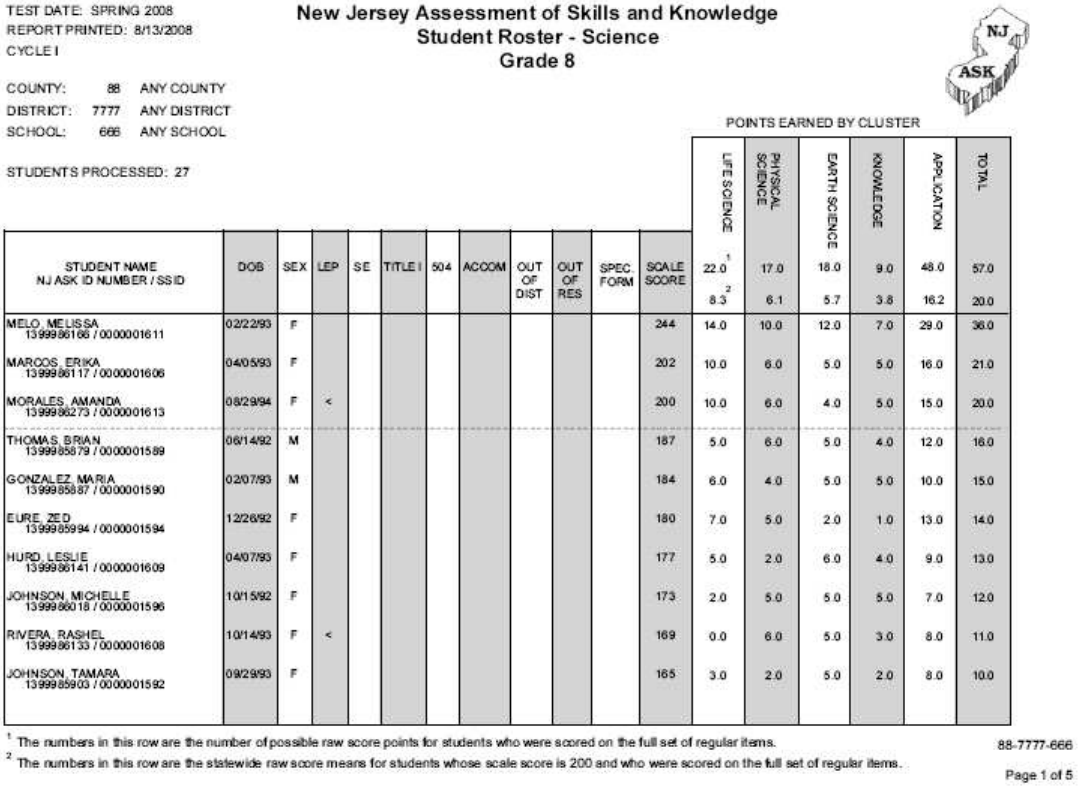
88-7777-666
FRIEDMAN, JANICE

Figure 11.1.3: Individual Student Report (back)

Student Roster

Depending on grade level, either two (LAL and mathematics) or three (LAL, mathematics, and science) content area-specific student rosters are produced and distributed. These reports provide a means of reviewing the test results of all students within a given school. For each content area, the Student Roster lists the names of the students (last name first), arranged by scale score in descending order. Thus, the first students listed on a student roster are those students with the highest scale scores in that content area. Students are listed alphabetically by last name when more than one student has achieved the same score. Students whose test booklets were voided, students coded APA or LEP-exempt, and students who were not present for a test due to medical emergency are listed alphabetically by last name at the end of the roster.

The Student Roster (Figure 11.1.4) provides a convenient method for reviewing students' test results by content area. The report displays student names in alphabetical order (last name first).



TEST DATE: SPRING 2008
REPORT PRINTED: 8/13/2008
CYCLE I

COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

STUDENTS PROCESSED: 27

New Jersey Assessment of Skills and Knowledge
Student Roster - Science
Grade 8

NJ ASK

STUDENT NAME NJ ASK ID NUMBER / SSID	DOB	SEX	LEP	SE	TITLE I	504	ACCOM	OUT OF DIST	OUT OF RES	SPEC FORM	SCALE SCORE	POINTS EARNED BY CLUSTER: LIFE SCIENCE	PHYSICAL SCIENCE	EARTH SCIENCE	KNOWLEDGE	APPLICATION	TOTAL
												22.0[1]	17.0	18.0	9.0	48.0	57.0
												8.3[2]	6.1	5.7	3.8	16.2	20.0
MELO, MELISSA 1399986166 / 0000001611	02/22/93	F									244	14.0	10.0	12.0	7.0	29.0	36.0
MARCOS, ERIKA 1399986117 / 0000001606	04/05/93	F									202	10.0	6.0	5.0	5.0	16.0	21.0
MORALES, AMANDA 1399986273 / 0000001613	08/29/94	F	<								200	10.0	6.0	4.0	5.0	15.0	20.0
THOMAS, BRIAN 1399985879 / 0000001589	06/14/92	M									187	5.0	6.0	5.0	4.0	12.0	16.0
GONZALEZ, MARIA 1399985887 / 0000001590	02/07/93	M									184	6.0	4.0	5.0	5.0	10.0	15.0
EURE, ZED 1399985994 / 0000001594	12/26/92	F									180	7.0	5.0	2.0	1.0	13.0	14.0
HURD, LESLIE 1399986141 / 0000001609	04/07/93	F									177	5.0	2.0	6.0	4.0	9.0	13.0
JOHNSON, MICHELLE 1399986018 / 0000001596	10/15/92	F									173	2.0	5.0	5.0	5.0	7.0	12.0
RIVERA, RASHEL 1399986133 / 0000001608	10/14/93	F	<								169	0.0	6.0	5.0	3.0	8.0	11.0
JOHNSON, TAMARA 1399985903 / 0000001592	09/29/93	F									165	3.0	2.0	5.0	2.0	8.0	10.0

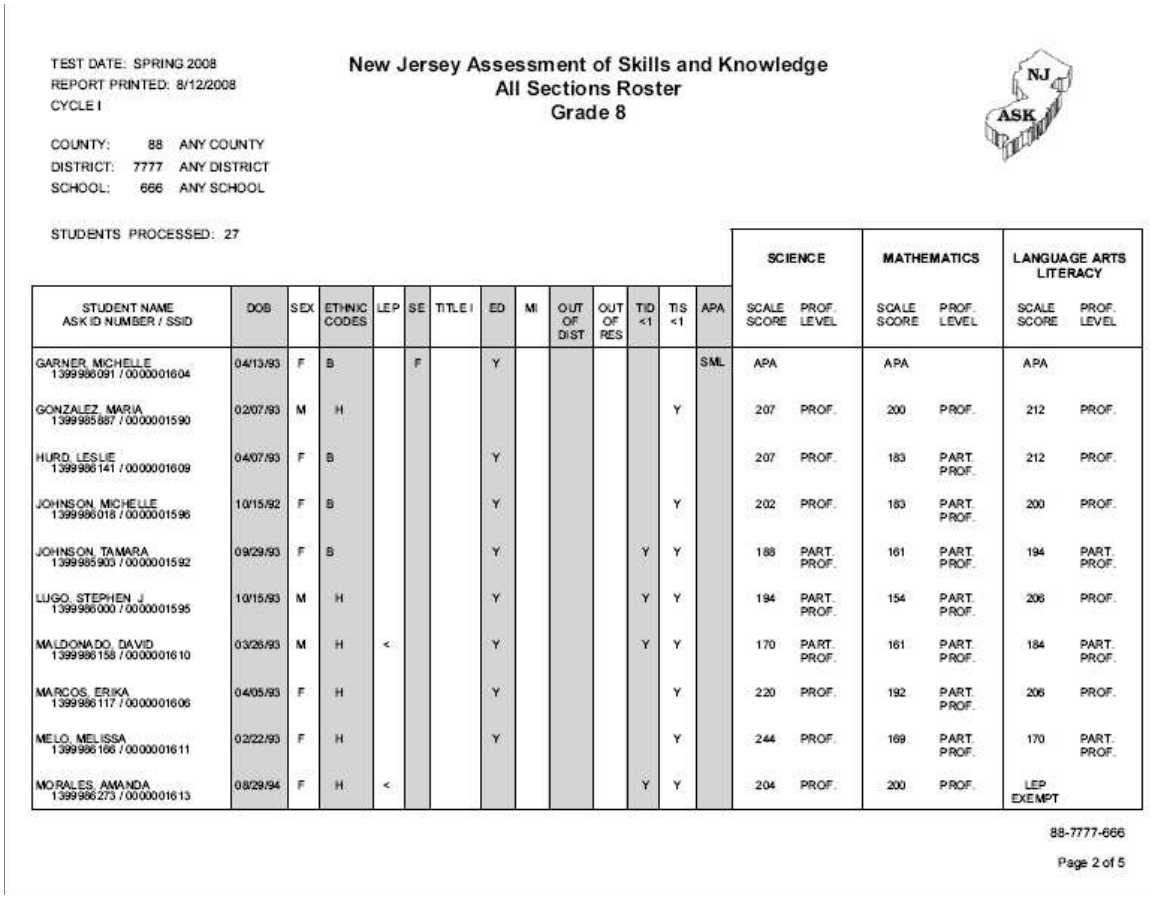
[1] The numbers in this row are the number of possible raw score points for students who were scored on the full set of regular items.
[2] The numbers in this row are the statewide raw score means for students whose scale score is 200 and who were scored on the full set of regular items.

88-7777-666
Page 1 of 5

Figure 11.1.4: Student Roster

All Sections Roster

The All Sections Roster (Figure 11.1.5) provides a convenient method for reviewing students' complete test results. The report displays student names in alphabetical order (last name first). Users of this report can quickly determine how a particular student performed in both LAL and mathematics in grades 5 through 7. Science is also included for eighth grade students. Following a student's identification information, the student's Scale Score and Proficiency Level (Partially Proficient, Proficient, or Advanced Proficient) are printed for each content area. If the student's test booklet was coded void, the reason code appears in this space.



TEST DATE: SPRING 2008
REPORT PRINTED: 8/12/2008
CYCLE I

COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

STUDENTS PROCESSED: 27

New Jersey Assessment of Skills and Knowledge
All Sections Roster
Grade 8

STUDENT NAME ASK ID NUMBER / SSID	DOB	SEX	ETHNIC CODES	LEP	SE	TITLE I	ED	MI	OUT OF DIST	OUT OF RES	TID <1	TIS <1	APA	SCIENCE SCALE SCORE	SCIENCE PROF. LEVEL	MATHEMATICS SCALE SCORE	MATHEMATICS PROF. LEVEL	LANGUAGE ARTS LITERACY SCALE SCORE	LANGUAGE ARTS LITERACY PROF. LEVEL
GARNER, MICHELLE 1399986091 / 0000001604	04/13/93	F	B		F		Y						SML	APA		APA		APA	
GONZALEZ, MARIA 1399985887 / 0000001590	02/07/93	M	H									Y		207	PROF.	200	PROF.	212	PROF.
HURD, LESLIE 1399986141 / 0000001609	04/07/93	F	B				Y							207	PROF.	183	PART. PROF.	212	PROF.
JOHNSON, MICHELLE 1399986018 / 0000001596	10/15/92	F	B				Y					Y		202	PROF.	183	PART. PROF.	200	PROF.
JOHNSON, TAMARA 1399985903 / 0000001592	09/29/93	F	B				Y				Y	Y		188	PART. PROF.	161	PART. PROF.	194	PART. PROF.
LUGO, STEPHEN J 1399986000 / 0000001595	10/15/93	M	H				Y				Y	Y		194	PART. PROF.	154	PART. PROF.	206	PROF.
MALDONADO, DAVID 1399986158 / 0000001610	03/26/93	M	H	<			Y				Y	Y		170	PART. PROF.	161	PART. PROF.	184	PART. PROF.
MARCOS, ERIKA 1399986117 / 0000001606	04/05/93	F	H				Y					Y		220	PROF.	192	PART. PROF.	206	PROF.
MELO, MELISSA 1399986166 / 0000001611	02/22/93	F	H				Y					Y		244	PROF.	169	PART. PROF.	170	PART. PROF.
MORALES, AMANDA 1399986273 / 0000001613	08/29/94	F	H	<							Y	Y		204	PROF.	200	PROF.	LEP EXEMPT	

88-7777-666

Page 2 of 5

Figure 11.1.5: All Sections Roster

Performance by Demographic Group Reports – School, District

The Performance by Demographic Group (PDG) report summarizes student performance by total students, education program, and student demographic subgroups:

Total,
General Education (GE),
Special Education (SE),
Limited English Proficient status (LEP),
Gender,
Migrant status,
Ethnicity, and
Economic status (disadvantaged vs. not disadvantaged).

The PDG reports provide additional summary views of student performance that can be used to make adjustments to curricula that may better serve these student subgroups.

The PDG is a multiple page report, one content area per page. Students may receive a scale score in one content area but not in others. The PDG reports are produced at the district and school levels.

For each grade and content area, the PDG provides the following information in tabular form, by demographic group:

- Number of students enrolled
- Number of students taking the APA instead of NJ ASK in this content area
- Number of students not present for the NJ ASK in this content area
- Number of students receiving voids
- Number of students with valid scale scores for this content area
- Number and percentage of students at each proficiency level
- Scale score mean for this content area

TEST DATE: SPRING 2008
REPORT PRINTED: 8/13/2008
CYCLE I

COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

New Jersey Assessment of Skills and Knowledge
Preliminary Performance By Demographic Group
School - Grade 8

LANGUAGE ARTS LITERACY

Demographic Group	Enrolled	APA Students [1]	Not Present	Voids [2]	Valid Scale Scores	Performance Data for Students with Valid Scale Scores [3]						
						Partially Proficient		Proficient		Advanced Proficient		Scale Score Mean
						Number	Percent	Number	Percent	Number	Percent	
Total Students [4]	27	6	0	4	17	9	52.9	8	47.1	0	0.0	198.1
General Education [5]	15	0	0	1	14	6	42.9	8	57.1	0	0.0	201.3
Special Education	8	6	0	0	2	2	100.0	0	0.0	0	0.0	182.5
Limited English Proficient [6]	6	0	0	3	3	2	66.7	1	33.3	0	0.0	192.3
Current LEP	5	0	0	3	2	2	100.0	0	0.0	0	0.0	182.5
Former LEP	1	0	0	0	1	0	0.0	1	100.0	0	0.0	212.0
Gender [7]												
Female	16	3	0	2	11	7	63.6	4	36.4	0	0.0	196.0
Male	11	3	0	2	6	2	33.3	4	66.7	0	0.0	201.8
Migrant Status												
Migrant	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Non-Migrant	27	6	0	4	17	9	52.9	8	47.1	0	0.0	198.1
Ethnicity [8]												
White	2	1	0	0	1	0	0.0	1	100.0	0	0.0	200.0
Black or African American	11	4	0	1	6	3	50.0	3	50.0	0	0.0	203.0
Asian	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Pacific Islander	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Hispanic or Latino	14	1	0	3	10	6	60.0	4	40.0	0	0.0	194.9
Amer. Indian/AK Native	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Other	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0.0
Economic Status												
Econ. Disadvantaged	20	5	0	2	13	7	53.8	6	46.2	0	0.0	196.8
Non-Econ. Disadvantaged	7	1	0	2	4	2	50.0	2	50.0	0	0.0	202.0

[1] These students are required to take the Alternate Proficiency Assessment (APA) instead of NJ ASK.
[2] Includes students coded LEP Exempt (LAL only) and students coded Medical Emergency.
[3] Percentages may not total 100 due to rounding.
[4] Students are included in Total Students only once, but they appear in all other categories that apply.
[5] Includes students coded Former LEP who are not Special Education.
[6] Includes students coded Current and Former LEP.
[7] Excludes students who did not have Gender coded.
[8] Students who did not have any Ethnicity coded and students with multiple Ethnicities coded are reported in the Other category only.

88-7777-666

Page 1 of 1

Figure 11.1.6 – Sample Performance by Demographic Group Report

Cluster Means Report

The Cluster Means for Students with Valid Scale Scores reports provide a way to look at the content cluster performance of a particular school as compared to the district, DFG, and state means, as well as to the Just Proficient Mean (the statewide raw score means for students with a scale score of 200). Where the PDGs offer scale score summary information, the Cluster Means reports provide raw score data.

The Cluster Means reports are provided at the school level, by grade and content area. The Cluster Means Report consists of multiple pages, one content area per page.

TEST DATE: SPRING 2008
REPORT PRINTED: 8/12/2008
CYCLE I

COUNTY: 88 ANY COUNTY
DISTRICT: 7777 ANY DISTRICT
SCHOOL: 666 ANY SCHOOL

New Jersey Assessment of Skills and Knowledge
Preliminary Cluster Means
for Students with Valid Scale Scores[1]
Grade 5 - Language Arts Literacy

	SCHOOL MEAN	DISTRICT MEAN	DFG A MEAN	STATE MEAN	TOTAL POINTS POSSIBLE	JUST PROFICIENT MEAN[2]
Writing					15	8.1
Total Students[3]	3.9	4.6	2.5	2.8		
General Education[4]	3.9	4.7	2.6	2.9		
Special Education	3.4	4.1	1.9	2.3		
Limited English Proficient[5]	3.6	4.4	2.3	2.4		
Current LEP	4.1	4.8	2.1	2.2		
Former LEP	2.0	2.7	2.5	2.6		
Persuasive					10	5.3
Total Students[3]	3.1	3.8	2.5	2.8		
General Education[4]	3.1	3.9	2.6	2.9		
Special Education	2.7	3.4	1.9	2.3		
Limited English Proficient[5]	2.5	3.2	2.3	2.4		
Current LEP	2.7	3.4	2.1	2.2		
Former LEP	2.0	2.7	2.5	2.6		
Speculative					5	2.8
Total Students[3]	5.9	6.6	4.5	4.8		
General Education[4]	6.4	7.1	4.6	4.9		
Special Education	4.2	4.9	3.9	4.3		
Limited English Proficient[5]	3.9	4.6	4.3	4.4		
Current LEP	4.2	4.9	4.1	4.2		
Former LEP	2.7	3.4	4.5	4.6		
Reading					60	31.9
Total Students[3]	16.3	17.0	17.4	21.1		
General Education[4]	17.6	18.3	18.9	22.2		
Special Education	15.1	15.8	12.5	16.4		
Limited English Proficient[5]	10.2	10.9	15.3	15.9		
Current LEP	10.6	11.4	13.5	14.3		
Former LEP	8.5	9.2	17.6	18.3		
Working with Text					23	13.5
Total Students[3]	6.8	7.5	8.9	10.7		
General Education[4]	7.2	7.9	9.6	11.3		
Special Education	6.8	7.5	6.5	8.3		
Limited English Proficient[5]	4.9	5.6	7.9	8.2		
Current LEP	5.3	6.0	7.0	7.3		
Former LEP	3.3	4.0	9.0	9.3		
Analyzing Text					37	18.4
Total Students[3]	9.5	10.2	8.6	10.4		
General Education[4]	10.4	11.1	9.3	10.9		
Special Education	8.3	9.0	6.0	8.1		
Limited English Proficient[5]	5.3	6.0	7.4	7.8		
Current LEP	5.4	6.1	6.5	6.9		
Former LEP	5.2	5.9	8.6	9.0		

[1] Excludes students who did not receive a scale score based on the full set of regular items in this content area.
[2] The numbers in this column are the statewide raw score means for students whose scale score is 200.
[3] Students are included in Total Students only once, but they appear in all other categories that apply.
[4] Includes students coded Former LEP who are not Special Education.
[5] Includes students coded Current and Former LEP.

88-7777-666

Page 1 of 1

Figure 11.1.7 – Sample Cluster Means Report

11.2 Cycle II Reports

Cycle II reports are produced after the completion of automatic rescoring of the constructed-response items and writing tasks. Any change of scores, as the result of the automatic rescoring, will be reflected in the Cycle II reports. Districts will receive new ISRs and stickers for students whose scores are affected by the automatic rescoring process. The Cycle II reports, produced separately for each grade, include the following:

- Performance by Demographic Group – School
- Performance by Demographic Group – District
- Performance by Demographic Group – DFG
- Performance by Demographic Group – Statewide
- Cluster Means Report

In Cycle II reporting the Performance by Demographic Group Reports, are also generated at the state and District Factor Group (DFG) levels.

11.3 State Summary Reporting

The state summary data file contains the same type of test results based on the Cycle II performance by demographics reports at the state, district, and school levels. This data file is available in text and in Excel formats and is posted on the NJDOE's Web site. (http://www.nj.gov/education/schools/achievement/)

11.4 Interpreting Reports

The NJ ASK score report information is used for the purpose of district monitoring. The data are also provided to assist districts in the review of current curricular programs. With the adoption of the New Jersey Core Curriculum Content Standards, all districts were required to implement standards based instruction. NJ ASK results displayed in school-level and district-level reports can provide meaningful information for educational program reviews.

All other factors being equal, the reliability (stability) of scores decreases as the number of items used decreases. Generally speaking, reliability is lower in clusters that have smaller numbers of items. All factors being equal, differences in mean cluster scores for clusters with smaller numbers of items must be greater than differences for clusters with large numbers of items before they can be considered meaningful. Decreases in reliability also increase the need for multiple measures, particularly where the number of students in the assessed group is small.

All clusters cannot be assumed to be of equal difficulty level. Cluster scores should, therefore, be compared to their respective Just Proficient Means to facilitate effective interpretation. Insofar as tests are not equated at the cluster level, cluster scores cannot be compared from year to year. Year-to-year comparisons should be limited to total test scores in the content areas tested. For each content area, it is the whole test level (only) for which scores are equated.

The NJ ASK reports provide information on clusters in content areas that need further attention. However, since some clusters were assessed with a relatively small number of items, evaluation of a student's performance should never be based solely on the results of the NJ ASK or any other single form of formal or informal assessment. Insofar as the NJ ASK is equated at the test level only, cluster performance should not be directly compared across multiple test administrations.

11.5 Accountability

The 2001 re-authorization of the Elementary and Secondary Education Act of 1965 was signed into federal law January 8, 2002. Characterized in the statute as "An Act to close the achievement gap with accountability, flexibility, and choice, so that no child is left behind," it carries the short title of the No Child Left Behind (NCLB) Act of 2001. Like New Jersey, many states have modified and/or supplemented their student assessments to comply with the federal statute and now use assessment results to make both federal and state accountability decisions.

11.6 Accountability Model - Overview

Adequate Yearly Progress (AYP) is the term used in NCLB to refer to the minimum improvement required of each school and district over the course of one year. It is measured at the school and district levels by:

- Measuring growth in the percentage of students scoring Proficient or above in reading and mathematics.
- Assessing improvement on one "other academic indicator."
- Testing at least 95% of enrolled students and student subpopulations of sufficient size.

As the term AYP suggests, progress toward NCLB academic goals is evaluated annually. New Jersey's definition of AYP is determined by a formula. The formula calculates the number of Proficient scores over the number of valid test scores, with 20% of the items responded to denoting a valid test score. Standards have been set based on starting points and incremental increases aimed at 100 percent proficiency by 2014. Separate starting points for this process have been set for LAL and mathematics for grades 4, 8, and 11.

11.7 Accountability Classification Results

Final AYP status under NCLB accountability requirements for 2007 (school year 2007-2008) can be found at the following address:

http://www.nj.gov/education/title1/accountability/ayp/0708/profiles/

APPENDIX A
CHECKLIST FOR FORMS DEVELOPMENT

Table A-1: Checklist for Forms Development

Item Data
Target average p-value of .6
As many items as possible have a p-value above 0.35 and below 0.90
As many items as possible have a pt. bis above 0.25
No item was used as a sample item.

Item Pool
For grades 6-8 one linking passage from the previous year's test was used.
All other passages were new to the operational test or had not been used operationally for several years.

Item Distribution
Item standards are distributed equally throughout the test
There are a variety of indicators assessed in each standard
MC items are generally in passage order, and OE items are at the end of the passage sets. WT items are in the appropriate places.
Answer key distribution is nearly equal between answer choices: A B C D
Having more than 2 MC items in a row with the same answer is avoided.

Name, Gender, and Ethnicity Distributions
Check gender distribution (number of passages or prompts which have a male and/or female): Male Female Both
Check ethnicity distribution (number of passages or prompts): Caucasian__Hispanic Asian__African American Other_____
There are NOT two or more items in the same session that have similar contexts.
There are NOT two or more items with similar answers or answer choices.
Sample items and test items do NOT clue each other.
Items do NOT have any fairness or sensitivity related to the names and contexts of the items.

APPENDIX B

MODIFICATIONS OF TEST ADMINISTRATION PROCEDURES FOR LIMITED ENGLISH PROFICIENT, SPECIAL EDUCATION STUDENTS, AND STUDENTS ELIGIBLE UNDER SECTION 504 OF THE REHABILITATION ACT OF 1973

Accommodations for Limited English Proficient (LEP) Students

NCLB prohibits exemptions from testing based on limited English proficient (LEP) status. However, LEP students were tested with one or more accommodations in the test administration procedures. Permitted accommodations include the following:

- Additional time up to 150% of the administration times indicated
- Translation of directions only to the student's native language.
- Translations of passages, items, prompts, and tasks are NOT permitted
- Use of a bilingual dictionary, preferably one normally used by the student as part of the instructional program.

Accommodations for Special Education students, and students eligible under section 504

In accordance with the Individuals with Disabilities Education Act (IDEA), students who are receiving special education services must participate in each subject area of the age-appropriate statewide assessment with the following exception:

Students with disabilities shall participate in the Alternate Proficiency Assessment in each content area where the nature of the student's disability is so severe that the student is not receiving instruction in any of the knowledge and skills measured by the general statewide assessment and the student cannot complete any of the types of questions on the assessment content area(s) even with accommodation and modifications. (New Jersey Administrative Code Chapter 6A:14-4.11[a]2)

Districts may use modifications of test administration procedures when administering the NJ ASK to special education students or to students eligible under Section 504 of the Rehabilitation Act of 1973. Decisions about participation and accommodations/modifications are made by the Individualized Education Program (IEP) or 504 team. Information about test content and item types from the test specifications booklets can be used to make this determination. Modifications in the areas listed below may be used separately or in combination.

Any accommodations or modifications of test administration procedures for students eligible for special education under the IDEA or eligible under Section 504 of the Rehabilitation Act of 1973 must be specified in the student's IEP or 504 accommodation plan. Accommodations or modifications must be consistent with the instruction and assessment procedures used in the student's classroom. Students eligible for modifications under Section 504 may not be classified but do have a permanent or temporary impairment in a major life function (for example: performing manual tasks, walking, seeing, hearing, speaking, etc.).

Advanced planning is integral to implementing accommodations/modifications effectively and ensuring that the security of test materials is maintained. If a student requires an accommodation or modification that is not listed below, contact the Office of State Assessments, NJ ASK Coordinator.

Accommodations must be recorded on the student's answer folder by the codes (A, B, C, or D) listed in this appendix. Verify that the coding on the Pre-ID labels is correct.

ACCEPTABLE ACCOMMODATIONS OR MODIFICATIONS

Code

A. Setting Accommodations

1. Administering the assessment:
    a. individually in a separate room
    b. in a small group in a separate room
    c. in the resource room
    d. in a special education classroom
    e. using carrels
    f. at home or in a hospital (this will depend on the nature of the assessment task)
2. Seating the student in the front of the room near the examiner or proctor
3. Seating the student facing the examiner or proctor
4. Providing special lighting
5. Providing special furniture (e.g., desks, trays, carrels)

B. Scheduling Accommodations

1. Adding time as needed
2. Providing frequent breaks
3. Terminating a section of the test when a student has indicated that he/she has completed all the items he/she can. The test examiner must ensure that the student has attempted all items in a section since items are not ordered by difficulty. When this accommodation is used, the test must be administered in a small group or individually to avoid distraction.

C. Test Materials Modifications

1. Administering the large-print version of test materials
2. Administering the Braille version of test materials

D. Test Procedures Modifications

1. Administration modifications
    a. reading directions aloud
    b. reading test items aloud (**YOU MAY NOT READ ALOUD OR SIGN THE READING PASSAGES IN LANGUAGE ARTS LITERACY—YOU MAY READ ONLY THE READING ITEMS ASSOCIATED WITH THE PASSAGE**); **ONLY the teacher who must read test items aloud is permitted to have a test book assigned to them for this task.**
    c. providing and ensuring that amplification (hearing aid and/or FM system) is in working order
    d. using a sign language or cued speech interpreter for administration of directions or items **but not reading passages**

e. masking a portion of the test booklet and/or answer folder to eliminate visual distractors or providing reading windows
f. repeating, clarifying, or rewording directions
g. providing written directions on a separate sheet or transparency
h. using an examiner who is familiar with the student
i. using an examiner who can communicate fluently in sign language (American Sign Language or a form of Manually Coded English)
j. providing manipulatives for math items
k. using graph paper for math section
l. using a Braille ruler and talking calculator
m using tactile or visual cues for deaf or hard of hearing students to indicate time to begin, time remaining, and time to end a particular part of the test

2. Response modifications

a. having an examiner record the student's identifying information on the answer folder, or grid corrections to the pre-ID label
b. dictating oral responses to a scribe (person who writes from dictation) – student must indicate all punctuation and must spell all key words
c. using a Braille writer to record responses
d. signing responses to a sign language interpreter (student must indicate all punctuation and must spell all key words)
e. recording responses on a word processor
f. using large-face calculators
g. using talking calculators
h. providing an Augmentative Communication device
i. using a larger diameter or modified special grip #2 pencil
j. masking portions of the answer folder to eliminate visual distractors
k. marking answers in the test booklet (an examiner would transfer the answers to an answer folder)
l. Allowing separate additional continuation pages for writing tasks. These pages MUST be properly marked to link them to the correct student for credit.

OTHER CONSIDERATIONS

Ensure that:

a. any medication has been appropriately adjusted so it will not interfere with the student's functioning.
b. eyeglasses are used, if needed.
c. hearing aids, FM systems, Augmentative Communication devices, word processors, or other equipment are functioning properly.
d. source and strength of light are appropriate.
e. all students can clearly see and hear the examiner.
f. all deaf or hard of hearing students who communicate aurally/orally are watching the examiner when instructions are given.

g. responses to CR items and writing tasks which are written or typed on separate sheets of paper by students eligible for this accommodation are labeled with student data paper-clipped to the front of the answer folder, and placed in the fluorescent orange envelope provided. **Follow packaging instructions in this manual or the student's responses cannot be linked to their responses on the other sections of the test and they will receive incomplete scores.** Copies of these pages should be made and retained on file by the school district until scores are received.

h. students using the large-print test booklets

1. mark their answers in the large-print answer folder. All responses must be transcribed into the regular answer folder provided in the large print kit.
2. may be instructed to skip items identified in the LP instructions. The spaces for these items must be left blank on the student's answer folder (included in the large-print kit).

3 who dictate responses on CR items and writing tasks indicate all punctuation and spell all key words.

i. students using the Braille test booklets

1. are instructed to bring a Braille ruler and a talking calculator to the test session.
2. are instructed to skip dropped items identified in the Braille instructions. The spaces for these items must be left blank on the student transcription answer folder (included in the Braille kit).
3. have answer folders transcribed from the Braille version by the examiner.
4. dictate their answers to the examiner or use a device that produces Braille. For dictations and responses recorded in Braille:
    - Students must indicate all punctuation and must spell all key words.
    - Examiners must transcribe the Braille responses into the regular answer folder included in the Braille kit.

j. students who communicate in sign language

1. have an interpreter to translate oral directions and test items (but not the Reading passages in the Language Arts Literacy section of the test). The interpreter should be able to communicate in the mode used by the student, American Sign Language or a form of Manually Coded English. The interpreter should be instructed to interpret so as not to give the answer to the student through the use of a particular sign or finger spelling.
2. using American Sign Language for CR and writing task responses will sign the responses to the interpreter who will interpret them into spoken English and a scribe will record the responses in the answer folder.
3. using Signed English or cued speech will sign/cue to the interpreter who will transliterate (word for word) into spoken English and a scribe will record the responses.

For any unresolved questions, contact the Office of Special Education Programs at (609) 292-2912.

APPENDIX C
SCORE CALCULATION CHARTS AND SCORING RUBRICS

Score Calculation Chart

Confirmed by NJ DOE (3/8/02)
Used for Means (x)
(Used when 3rd Reader is equal to or adjacent Reader 1 or Reader 2)

Absolute Difference ($\lvert 1^{st} - 2^{nd} \rvert$)	Additional Conditions*	Additional Conditions*	Score Calculation*
0	--	--	$(1^{st} + 2^{nd})/2$
1	--	--	$(1^{st} + 2^{nd})/2$
2	$1^{st} < 3^{rd} < 2^{nd}$ or $2^{nd} < 3^{rd} < 1^{st}$	--	$(1^{st} + 2^{nd})/2$
2	$3^{rd} <$ $((1^{st} + 2^{nd})/2)$	$1^{st} < 2^{nd}$	$(1^{st} + 3^{rd})/2$
		$2^{nd} < 1^{st}$	$(2^{nd} + 3^{rd})/2$
	$3^{rd} >$ $((1^{st} + 2^{nd})/2)$	$1^{st} < 2^{nd}$	$(2^{nd} + 3^{rd})/2$
		$2^{nd} < 1^{st}$	$(1^{st} + 3^{rd})/2$
3	$3^{rd} = 1^{st}$ or $(3^{rd} \pm 1) = 1^{st}$	--	$(1^{st} + 3^{rd})/2$
	$3^{rd} = 2^{nd}$ or $(3^{rd} \pm 1) = 2^{nd}$	--	$(2^{nd} + 3^{rd})/2$
4 and 5	$3^{rd} = 1^{st}$ or $(3^{rd} \pm 1) = 1^{st}$	--	$(1^{st} + 3rd)/2$
	$3^{rd} = 2^{nd}$ or $(3^{rd} \pm 1) = 2^{nd}$	--	$(2^{nd} + 3rd)/2$

Additional Score Calculations

Used for Means (x)
(Used when Reader 3 is NOT equal to or adjacent to Either Reader 1 or Reader 2)

Condition	Score Calculation
$1^{st} < 3^{rd} < 2^{nd}$ or $2^{nd} < 3^{rd} < 1^{st}$	Use 3^{rd} reading
$1^{st} < 2^{nd} < 3^{rd}$ or $3^{rd} < 2^{nd} < 1^{st}$	$(2^{nd} + 3rd)/2$
$2^{nd} < 1^{st} < 3^{rd}$ or $3^{rd} < 1^{st} < 2^{nd}$	$(1^{st} + 3rd)/2$

Please note: Scores from the two readers of the Persuasive prompt are summed and thus weighted more heavily in calculating the total score as examinees are given 45 minutes to complete the Persuasive prompt. Whereas, scores from the Speculative prompt are averaged because the examinees are allotted only 25 minutes to complete this writing task.

Score Calculation Chart

Confirmed by NJ DOE (3/8/02)
Used for Sum (Σ)
(Used when 3rd Reader is equal to or adjacent Reader 1 or Reader 2)

Absolute Difference ($\lvert 1^{st} - 2^{nd} \rvert$)	Additional Conditions*	Additional Conditions*	Score Calculation*
0	--	--	($1^{st} + 2^{nd}$)
1	--	--	($1^{st} + 2^{nd}$)
2	$1^{st} < 3^{rd} < 2^{nd}$ or $2^{nd} < 3^{rd} < 1^{st}$	--	($1^{st} + 2^{nd}$)
2	$3^{rd} < ((1^{st} + 2^{nd})/2)$	$1^{st} < 2^{nd}$	($1^{st} + 3^{rd}$)
		$2^{nd} < 1^{st}$	($2^{nd} + 3^{rd}$)
	$3^{rd} > ((1^{st} + 2^{nd})/2)$	$1^{st} < 2^{nd}$	($2^{nd} + 3^{rd}$)
		$2^{nd} < 1^{st}$	($1^{st} + 3^{rd}$)
3	$3^{rd} = 1^{st}$ or $(3^{rd} \pm 1) = 1^{st}$	--	($1^{st} + 3^{rd}$)
	$3^{rd} = 2^{nd}$ or $(3^{rd} \pm 1) = 2^{nd}$	--	($2^{nd} + 3^{rd}$)
4 and 5	$3^{rd} = 1^{st}$ or $(3^{rd} \pm 1) = 1^{st}$	--	(1^{st} + 3rd)
	$3^{rd} = 2^{nd}$ or $(3^{rd} \pm 1) = 2^{nd}$	--	(2^{nd} + 3rd)

Additional Score Calculations

Used for Sum (Σ)
(Used when Reader 3 is NOT equal to or adjacent to Either Reader 1 or Reader 2)

Condition	Score Calculation
$1^{st} < 3^{rd} < 2^{nd}$ or $2^{nd} < 3^{rd} < 1^{st}$	Use 3^{rd} reading*2
$1^{st} < 2^{nd} < 3^{rd}$ or $3^{rd} < 2^{nd} < 1^{st}$	(2^{nd} + 3rd)
$2^{nd} < 1^{st} < 3^{rd}$ or $3^{rd} < 1^{st} < 2^{nd}$	(1^{st} + 3rd)

Summary of Open-Ended Scoring

Confirmed by NJ DOE (3/8/02)
When to Use the Mean vs. Sum Scoring Rules

Subject	**Valid scores**	**Grade 11**
Reading OE	0-4 *	Mean
Writing – Picture	1-6 **	Mean
Writing – Persuasive	1-6 **	Sum
Revise / Edit	0-4 *	Sum
Math OE	0-3 *	Mean
Sci OE	0-3	Mean

* = RF = 6 for Fragment, refusing or unable to write on the topic
NR = 7 for no response
OT = 8 for off topic
NE = 9 for not English

** = NR (No Response=0)
WF (Wrong Format=7)
OT (Off Topic=8)
NE (Not English=9)

Scoring Rubrics

Table C.1: New Jersey Registered Holistic Scoring Rubric

In scoring, consider the grid of written language	Inadequate Command	Limited Command	Partial Command	Adequate Command	Strong Command	Superior Command
Score	**1**	**2**	**3**	**4**	**5**	**6**
Content and Organization	• May lack opening and/or closing	• May lack opening and/or closing	• May lack opening and/or closing	• Generally has opening and/or closing	• Opening and closing	• Opening and closing
	• Minimal response to topic; uncertain focus	• Attempts to focus • May drift or shift focus	• Usually has single focus	• Single focus	• Single focus • Sense of unity and coherence • Key ideas developed	• Single, distinct focus • Unified and coherent • Well-developed
	• No planning evident; disorganized	• Attempts organization • Few, if any, transitions between ideas	• Some lapses or flaws in organization • May lack some transitions between ideas	• Ideas loosely connected • Transitions evident	• Logical progression of ideas • Moderately fluent • Attempts compositional risks	• Logical progression of ideas • Fluent, cohesive • Compositional risks successful
	• Details random, inappropriate, or barely apparent	• Details lack elaboration, i.e., highlight paper	• Repetitious details • Several unelaborated details	• Uneven development of details	• Details appropriate and varied	• Details effective, vivid, explicit, and/or pertinent
Usage	• No apparent control • Severe/numerous errors	• Numerous errors	• Errors/patterns of errors may be evident	• Some errors that do not interfere with meaning	• Few errors	• Very few, if any, errors
Sentence Construction	• Assortment of incomplete and/or incorrect sentences	• Excessive monotony/same structure • Numerous errors	• Little variety in syntax • Some errors	• Some variety • Generally correct	• Variety in syntax appropriate and effective • Few errors	• Precision and/or sophistication • Very few, if any, errors
Mechanics	• Errors so severe they detract from meaning	• Numerous serious errors	• Patterns of errors evident	• No consistent pattern of errors • Some errors that do not interfere with meaning	• Few errors	• Very few, if any, errors

Note: All unscorable responses (NSRs), with the exception of NR, must be coded by the Scoring Director.

Table C.2: New Jersey Registered Holistic Scoring Rubric Grade 5

In scoring, consider the grid of written language	Inadequate Command	Limited Command	Partial Command	Adequate Command	Strong Command
Score	**1**	2	**3**	**4**	**5**
Content and Organization	May lack opening and/or closing	May lack opening and/or closing	May lack opening and/or closing	Generally has opening and/or closing	Opening and closing
	Minimal response to topic; uncertain focus	Attempts to focus May drift or shift focus	Usually has single focus	Single focus	Single focus Sense of unity and coherence Key ideas developed
	No planning evident; disorganized	Attempts organization Few, if any, transitions between ideas	Some lapses or flaws in organization May lack some transitons between ideas	Ideas loosely connected Transitions evident	Logical progression of ideas Moderately fluent Attempts compositional risks
	Details random, inappropriate, or barely apparent	Details lack elaboration, i.e. highlight paper	Repetitious details Several unelaborated details	Uneven development of details	Details appropriate and varied
Usage	No apparent control Severe/numerous errors	Numerous errors	Errors/patterns of errors may be evident	Some errors that do not interfere with meaning	Few errors
Sentence Construction	Assortment of incomplete and/or incorrect sentences	Excessive monotony/same structure Numerous errors	Little variety in syntax Some errors	Some variety Generally correct	Variety in syntax appropriate and effecti
Mechanics	Errors so severe they detract from meaning	Numerous serious errors	Patterns of errors evident	No consistent pattern of errors Some errors that do not interfer with meaning	Few errors

Table C.2: New Jersey Registered Holistic Scoring Rubric Grade 5 (continued)

Content/Organization	Usage	Sentence Construction	Mechanics
Communicates intended message to intended audience Relates to topic Opening and closing Focused Logical progression of ideas Transitions Appropriate details and information	Tense formation Subject-verb agreement Pronouns usage/agreement Word choice/meaning Proper modifiers	Variety of type, structure and length Correct construction	Spelling Capitalization Punctuation

Table C.3: Open-Ended Scoring Rubric Reading

Points	Criteria
4	A 4-point response clearly demonstrates understanding of the task, completes all requirements, ar provides an insightful explanation/opinion that links to or extends aspects of the text.
3	A 3-point response demonstrates an understanding of the task, completes all requirements, and provides some explanation/opinion using situations or ideas from the text as support.
2	A 2-point response may address all of the requirements, but demonstrates a partial understanding the task, and uses text incorrectly or with limited success resulting in an inconsistent or flawed explanation.
1	A 1-point response demonstrates minimal understanding of the task, does not complete the requirements, and provides only a vague reference to or no use of the text.
0	A 0-point response is irrelevant or off-topic.

Table C.4: NJ ASK Generic Mathematics Rubric

3-Point Response	The response shows complete understanding of the problem's essential mathematical concepts. The student executes procedures completely and gives relevant responses to all parts of the task. The response contains few minor errors, if any. The response contains a clear, effective explanation detailing how the problem was solved so that the reader does not need to infer how and why decisions were made.
2-Point Response	The response shows nearly complete understanding of the problem's essential mathematical concepts. The student executes nearly all procedures and gives relevant responses to most parts of the task. The response may have minor errors. The explanation detailing how the problem was solved may not be clear, causing the reader to make some inferences.
1-Point Response	The response shows limited understanding of the problem's essential mathematical concepts. The response and procedures may be incomplete and/or may contain major errors. An incomplete explanation of how the problem was solved may contribute to questions as to how and why decisions were made.
0-Point Response	The response shows insufficient understanding of the problem's essential mathematical concepts. The procedures, if any, contain major errors. There may be no explanation of the solution or the reader may not be able to understand the explanation. The reader may not be able to understand how and why decisions were made.

The zero-to-three point generic scoring rubric below was created to help readers score open-ended responses consistently. In scoring, the reader should accept the use of appropriate diagrams, charts, formulas, and/or symbols which are part of a correct answer even when the question does not specifically request their use.

Table C.5: NJ ASK Generic Science Rubric

3-Point Response	Student response is reasonably complete, clear, and satisfactory.
2-Point Response	Student response has minor omissions and/or some incorrect or non-relevant information.
1-Point Response	Student response includes some correct information, but most information included in the response is either incorrect or not relevant.
0-Point Response	Student attempts the task but the response is incorrect, irrelevant, or inappropriate.

APPENDIX D-1
DEMOGRAPHICS OF STANDARD SETTING PARTICIPANTS

Table D1-1: Demographic Background of PLD Panelists by Content Area/Grade Level

		LAL 5 - 6	LAL 7 - 8	MATH 5 - 6	MATH 7 - 8
Sex	F	11	11	7	15
	M	0	2	2	3
	Other	0	1	0	0
Race	AA	1	0	0	2
	H	0	1	1	0
	W	10	12	7	16
	Other	0	1	1	0
DFG	A	2	2	2	2
	B	1	2	0	2
	CD	1	1	2	2
	DE	1	0	1	3
	FG	2	2	2	1
	GH	0	2	1	1
	I	1	3	1	3
	J	2	1	0	2
	R	0	1	0	2
	Other	1	0	0	0
Region	C	5	5	5	5
	N	4	6	2	6
	S	2	3	2	7

Table D1-2: Demographic Background of Standard Setting Panelists by Content Area/Grade Level

		Grade/Content Area						
		Math 5-6	Math 7-8	LAL 5-6	LAL 7-8	SLAL 5-6	SLAL 7-8	TOTAL
TOTAL		22	22	18	16	4	4	86
Sex	Females	18	17	16	15	4	3	73
	Males	4	5	2	1	0	1	13
Race	White	21	20	16	12	0	0	69
	African American	0	1	1	2	0	0	4
	Hispanic	1	1	1	1	0	0	4
	Other/Not Indicated	0	0	0	1	4	4	9
DFG	A	5	5	6	3	1	3	23
	B	5	2	3	3	0	0	13
	CD	3	1	1	0	1	1	7
	DE	2	2	0	1	0	0	5
	FG	4	1	1	4	1	0	11
	GH	0	4	3	3	0	0	10
	I	2	6	3	2	1	0	14
	J	1	1	1	0	0	0	3

APPENDIX D-2
PERFORMANCE LEVEL DESCRIPTORS

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Language Arts Literacy
Grade 5

Partially Proficient

Reading. Students performing at the partially proficient level construct meaning by using reading strategies to comprehend on a literal level, make some connections to the text, and provide limited support for opinions and conclusions. They demonstrate limited understanding of text structures and literary elements, and attempt to use context clues to determine the meaning of unknown words.

Writing. As partially proficient writers, these students may develop a single focus and attempt to organize and connect ideas with relevant details. These students use limited word choice and sentence structure, and incorporate basic writing mechanics.

Proficient

Reading. Students performing at the proficient level construct meaning by using reading strategies to comprehend literally and inferentially. Proficient students synthesize details and analyze text. These students identify and explain literary elements, figurative language, and text structures. Proficient fifth grade students make connections, draw conclusions, and identify author's purpose, views, or beliefs. These students determine meaning of words and phrases by applying knowledge of word structure and using context clues.

Writing. As proficient writers, these students develop and maintain a single focus by organizing and connecting ideas with relevant details. Proficient students exhibit some variety in word choice and sentence structure, attempt writing techniques and use some transitions while incorporating basic writing mechanics.

Advanced Proficient

Reading. As readers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, the advanced proficient students extend meaning by making connections, generating new ideas, and making sound judgments about text.

Writing. As writers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, these students also use supporting details to convey and elaborate ideas. Advanced proficient students use fluid transitions, strong and appropriate word choice and sentence variety to purposefully engage the reader.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Language Arts Literacy
Grade 6

Partially Proficient

Reading. Students performing at the partially proficient level construct meaning by using reading strategies for literal and limited inferential comprehension, make connections with the text and provide some support for opinions and conclusions. They demonstrate some understanding of text structures and literary elements, and use word structure and context clues to determine the meaning of unknown words.

Writing. As partially proficient writers, these students develop a single focus and organize and connect ideas with some supporting details. They write for a limited variety of purposes, attempt to provide support for opinions and conclusions, and incorporate basic writing mechanics.

Proficient

Reading. Students performing at the proficient level construct meaning by using reading strategies to comprehend literally and inferentially. Students at this level identify the central idea, relevant and essential details, and textual conventions. Proficient students are able to analyze and evaluate organizational structures and literary elements and devices. Proficient sixth grade students make connections and inferences, and identify author's purpose, views or beliefs. These students determine meaning of words and phrases by applying knowledge of word structure and using context clues.

Writing. As proficient writers, these students develop and maintain a single focus and supporting details within a clear and appropriate organizational structure. Proficient students write for a variety of purposes while keeping their audience in mind. Students provide support for opinions and conclusions, and attempt to use literary devices.

Advanced Proficient

Reading. As readers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, students demonstrate comprehension and extend meaning by making connections, generating new ideas, and making insightful judgments about text.

Writing. As writers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, the advanced proficient students develop a logical progression of ideas with style, voice, and precise word choice. Students at this level apply appropriate compositional risks.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Language Arts Literacy
Grade 7

Partially Proficient

Reading. Seventh grade students performing at the partially proficient level construct meaning by using reading strategies for literal and inferential comprehension, and make connections with the text. They identify the central idea or theme, demonstrate some understanding of text structures and literary elements and provide limited support for opinions and conclusions. These students use word structure and context clues to determine the meaning of unknown words.

Writing. Seventh grade students partially proficient in writing develop a single focus and organize and connect ideas with some supporting details. They may establish a purpose for writing and provide limited support for opinions and conclusions. These students demonstrate some control of Standard English conventions.

Proficient

Reading. Seventh grade students performing at the proficient level demonstrate an understanding of a variety of texts. Proficient students identify the author's purpose, tone, and central idea or theme. They recognize the main idea and support it with evidence. Students use the organizational structure of text to construct meaning. They use word and sentence structure as well as context clues to determine the meaning of unknown words and phrases. Students interpret, extrapolate, and synthesize information.

Writing. Seventh grade students proficient in writing are able to develop a single focus and supply supporting details in a variety of organizational structures. Students at this level establish a purpose for writing and provide support for opinions and conclusions. Proficient students demonstrate control of Standard English conventions.

Advanced Proficient

Reading. In addition to demonstrating the skills outlined for proficient students, advanced proficient students infer themes or central ideas while analyzing and evaluating texts. Advanced students make connections to extend understanding and critically respond to a variety of texts.

Writing. As writers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. In addition, the advanced proficient students create a clear and unified composition by developing a central theme, supporting details and appropriate organizational structure. They demonstrate sophisticated use of literary elements as well as a precise vocabulary. Advanced students apply compositional risks.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Language Arts Literacy
Grade 8

Partially Proficient

Reading. Eighth grade students performing at the partially proficient level construct meaning by using reading strategies for literal and inferential comprehension, and make connections with the text. They identify the central idea or theme, demonstrate some understanding of text structures and literary elements, and provide some support for opinions and conclusions. These students use word structure and context clues to determine the meaning of unknown words, and attempt to interpret, extrapolate, and synthesize information.

Writing. Eighth grade students partially proficient in writing develop a single focus and organize and connect ideas with supporting details. They establish a purpose for writing and provide limited support for opinions and conclusions. These students demonstrate some control of Standard English conventions

Proficient

Reading. Eighth grade students performing at the proficient level show an overall understanding of a variety of texts at literal and inferential levels. They make connections while interpreting and analyzing text. Proficient students recognize the author's purpose and respond critically to central themes, supporting details, and organizational structures of text. They interpret, extrapolate and synthesize information. Students support opinions and conclusions with evidence from the text.

Writing. Eighth grade students proficient in writing develop and sustain a single focus, include and elaborate supporting details, and use a variety of organizational structures. They establish a purpose for writing and elaborate on ideas. Students at this level provide support for opinions and conclusions while demonstrating control of Standard English conventions.

Advanced Proficient

Reading. In addition to demonstrating the skills outlined for proficient students, advanced proficient students show a sophisticated understanding of abstract themes and ideas. They make insightful connections while interacting with, interpreting, analyzing, and critiquing text. The advanced students synthesize, analyze, and evaluate written text.

Writing. As writers, students performing at the advanced level of proficiency consistently demonstrate the skills outlined for proficient performance. The advanced proficient students, in addition to developing a central theme, supporting details and organizational structure, demonstrate sophisticated use of literary elements and vivid vocabulary. Advanced students show a high degree of sustained control over textual conventions and apply compositional risks.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 5

Partially Proficient

Students performing at the partially proficient level have limited recognition and understanding of and inconsistently apply basic mathematical concepts, skills, and vocabulary to theoretical and real world situations.

- These students may understand that a quantity can be represented numerically in various ways. Partially proficient students perform basic computational procedures with inconsistent accuracy.
- Partially proficient students struggle to apply geometric properties and comprehend spatial relationships.
- Partially proficient students have difficulty using informal algebraic concepts and processes.
- Partially proficient students inconsistently read, construct, and interpret data and graphs. They inconsistently apply the concepts and methods of discrete mathematics.

These students will occasionally infer, reason and estimate while problem solving. Partially proficient students are frequently ineffectual in selecting a successful process or strategy. These students have difficulty demonstrating a basic understanding of mathematical concepts through written expression and/or symbolic representation.

Proficient

Students performing at the proficient level recognize and understand basic mathematical concepts, skills, and vocabulary and apply them to theoretical and real world situations.

- Proficient students understand that a quantity can be represented numerically in various ways. These students perform basic computational procedures.
- Proficient students apply geometric properties and spatial relationships.
- Proficient students use informal algebraic concepts and processes.
- Proficient students read, construct, and interpret data and graphs. They apply the concepts and methods of discrete mathematics.

These students infer, reason, and estimate while problem solving. Proficient students are flexible in selecting a successful process or strategy. These students demonstrate a basic understanding of mathematical concepts through written expression and/or symbolic representation.

Advanced Proficient

Students performing at the advanced proficient level consistently demonstrate the qualities outlined for proficient performance. In addition, advanced proficient students analyze methods for appropriateness, synthesize processes, and evaluate mathematical relationships. Advanced proficient students demonstrate conceptual understanding by consistently providing clear and complete explanations. These students demonstrate the ability to transfer mathematical concepts to other applications and successfully form conjectures.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 6

Partially Proficient

Sixth grade students performing at the partially proficient level in mathematics demonstrate limited evidence of and/or an inability to communicate conceptual understanding of procedural and analytical skills. Partially proficient students inconsistently apply mathematical skills and knowledge to theoretical and real world situations. These students struggle to integrate skills across the four mathematical content standards.

- Partially proficient students may demonstrate some understanding of but inconsistently apply appropriate standard numerical operations. These students may determine the reasonableness of an answer.
- Partially proficient students have difficulty understanding and applying geometric concepts including properties, measurement, and special relationships.
- Partially proficient students may inconsistently use simple algebraic concepts and processes.
- They inconsistently read, construct, and interpret data and graphs, determine probabilities of events, and may misapply the concepts and methods of discrete mathematics.

Proficient

Sixth grade students performing at the proficient level in mathematics demonstrate evidence of and communicate conceptual understanding of procedural and analytical skills. Proficient students apply mathematical skills and knowledge to theoretical and real world situations. In addition, these students integrate skills across the four mathematical content standards.

- Proficient students understand and apply appropriate standard numerical operations: an understanding for problem solving in practical situations. These students can determine the reasonableness of an answer.
- Proficient students understand and apply geometric concepts including properties, measurement, and special relationships.
- Proficient students use simple algebraic concepts and processes.
- Proficient students read, construct, and interpret data and graphs, determine probabilities of events, and apply the concepts and methods of discrete mathematics.

Advanced Proficient

Sixth grade students performing at the advanced proficient level in mathematics consistently demonstrate the qualities for proficient performance. In addition, these students demonstrate the use of abstract thinking and mathematical fluency to provide explanations that are consistently clear and thorough. Advanced proficient students support logical, efficient methods in solving problems. These students consistently make accurate inferences and predictions. Advanced proficient students may support responses with appropriate mathematical explanation. These students successfully analyze and draw appropriate inferences from data. They demonstrate the ability to transfer mathematical concepts to other applications and successfully form conjectures.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 7

Partially Proficient

Seventh grade students performing at the partially proficient level demonstrate limited evidence of conceptual understanding of mathematical knowledge, procedures, skills, and processes across the four content standards. A partially proficient student inconsistently demonstrates the ability to:

- identify, recognize and compare different representations of numbers. They demonstrate a limited understanding of the meanings and uses of numerical operations.
- identify, describe, and classify two- and three-dimensional shapes, apply geometric properties, and solve problems involving geometry, spatial sense, and measurement.
- recognize, evaluate and identify algebraic representations and simple patterns of theoretical and real-world problems, including the extension of simple patterns.
- model situations, solve problems, and analyze, and draw appropriate inferences from data. They have difficulty understanding and interpreting the fundamental concepts of probability, and inconsistently apply concepts of discrete mathematics to solve problems.

Partially proficient students comprehend some mathematical vocabulary and communicate their reasoning ineffectually.

Proficient

Seventh grade students performing at the proficient level demonstrate evidence of conceptual understanding of mathematical knowledge, procedures, skills, and processes across the four content standards.

- Proficient students identify, recognize and compare different representations of numbers and demonstrate an understanding of the meanings and uses of numerical operations.
- Proficient students identify, describe, and classify two- and three-dimensional shapes, apply geometric properties, and solve problems involving geometry, spatial sense, and measurement.
- Proficient students recognize, evaluate and identify algebraic representations and simple patterns of theoretical and real-world problems, including the extension of simple patterns.
- Proficient students model situations, solve problems, and analyze, and draw appropriate inferences from data. They understand and interpret the fundamental concepts of probability and apply concepts of discrete mathematics to solve problems.

Proficient students are mathematically literate in their ability to comprehend vocabulary, understand appropriate context and communicate their reasoning.

Advanced Proficient

Advanced proficient students demonstrate the qualities outlined for proficient performance. Additionally, they use abstract reasoning and demonstrate mathematical fluency through problem solving and assess the reasonableness of their solution. Advanced proficient students extrapolate information and form and support conclusions through clear and thorough explanations.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 8

Partially Proficient

Eighth grade students performing at the partially proficient level demonstrate limited evidence of conceptual and analytical understanding of mathematical knowledge, procedures, skills and processes across and within the four content standards. A partially proficient student inconsistently demonstrates the ability to:

- identify, recognize and compare different representations of numbers. They demonstrate a limited understanding of the meanings and uses of numerical operations and number systems.
- apply geometrical concepts; identify, describe, and classify two- and three-dimensional shapes; and solve problems involving geometry, spatial sense and measurement.
- represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes. Students have difficulty modeling situations algebraically, symbolically and graphically.
- analyze, interpret, and make predictions based on appropriate representations for sets of data. They are limited in applying and interpreting the concepts of probability and discrete mathematics to solve problems.

Partially proficient students comprehend some mathematical vocabulary and communicate their reasoning ineffectually within and among the mathematical content areas.

Proficient

Eighth grade students performing at the proficient level demonstrate evidence of conceptual and analytical understanding of mathematical knowledge, procedures, skills and processes across and within the four content standards.

- Proficient students identify, recognize and compare different representations of numbers and demonstrate an understanding of the meanings and uses of numerical operations and number systems.
- Proficient students apply geometrical concepts; identify, describe, and classify two- and three-dimensional shapes; and solve problems involving geometry, spatial sense and measurement.
- Proficient students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes. Students will model situations algebraically, symbolically and graphically.
- Proficient students analyze, interpret, and make predictions based on appropriate representations for sets of data. They apply and interpret the concepts of probability and discrete mathematics to solve problems.

Proficient students are mathematically literate in their ability to comprehend vocabulary, understand appropriate context and communicate their reasoning within and among the mathematical content areas.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
Performance Level Descriptors
Mathematics
Grade 8 (continued)

Advanced Proficient

Advanced proficient students demonstrate the qualities outlined for the proficient student. Additionally, advanced proficient students use inductive and deductive reasoning as well as demonstrate mathematical fluency. Students performing at the advanced proficient level demonstrate clear and thorough conceptual understanding. They are able to extrapolate information to form and support conclusions through clear and thorough explanations as well assess the reasonableness of their solution.

New Jersey Assessment of Skills and Knowledge (NJ ASK)
and Grade Eight Proficiency Assessment (GEPA)
Performance Level Descriptors
Science
Grade 8

Proficient

The Proficient student can recognize the structural levels of living things. This student knows that some traits of organisms are beneficial and some detrimental. This student can interpret visual and textual data to understand the relationship within a food web and the interdependence of living and nonliving systems.

The proficient student can recognize the effect force has on an object, trace the flow of energy through a system, and use the properties of matter to identify and separate materials. This student can understand different types of energy and use information from data charts to interpret relationships and predict outcomes.

The proficient student can recognize the existence of a relationship between the moon and tides, recognize the different characteristics of the planets in the solar system, and understand the natural forces that change the surface of the Earth, including chemical and physical weathering.

Advanced Proficient

The advanced proficient student can support scientific conclusions with valid contextual and visual data and make predictions based on the interactions of living things. This student is able to use interpretive skills to analyze visual and textual data in order to solve problems dealing with the application of force and energy.

The advanced proficient student understands the difference between types of energy waves and can recognize and apply experimental principles and empirical data.

The advanced proficient student can recognize the nature of the tides' relationship to Earth, Sun, and moon; interpret topographical maps; and identify the steps in the process of weathering and erosion.

APPENDIX E
SCALE SCORE CUMULATIVE FREQUENCY DISTRIBUTIONS

LAL Grade 5

Raw Score	Scale Score	All Students		Male	Female	White	Afr.-A.	Hisp.
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
0	100	20	0.02	0.02	0.02	0.04	0.04	0.01
4	104	32	0.03	0.03	0.03	0.08	0.04	0.01
4.5	107	34	0.03	0.04	0.04	0.09	0.04	0.01
5	110	53	0.05	0.06	0.04	0.13	0.07	0.02
6	115	81	0.08	0.10	0.06	0.20	0.10	0.03
6.5	117	85	0.08	0.10	0.06	0.22	0.11	0.03
7	119	130	0.13	0.17	0.09	0.33	0.18	0.05
7.5	121	134	0.13	0.17	0.09	0.33	0.19	0.05
8	123	197	0.19	0.27	0.12	0.45	0.34	0.08
8.5	125	203	0.20	0.27	0.13	0.46	0.36	0.08
9	127	286	0.28	0.39	0.17	0.70	0.48	0.11
9.5	128	296	0.29	0.40	0.17	0.72	0.50	0.11
10	130	404	0.40	0.56	0.23	0.94	0.71	0.16
10.5	131	423	0.42	0.58	0.25	1.00	0.71	0.17
11	133	569	0.56	0.79	0.32	1.39	0.96	0.22
11.5	134	585	0.58	0.81	0.33	1.44	0.98	0.22
12	136	765	0.75	1.06	0.42	1.82	1.30	0.30
12.5	137	806	0.80	1.12	0.44	1.91	1.38	0.32
13	139	1006	0.99	1.41	0.53	2.41	1.67	0.40
13.5	140	1041	1.03	1.46	0.56	2.50	1.73	0.41
14	141	1282	1.26	1.77	0.72	3.20	2.10	0.50
14.5	142	1361	1.34	1.84	0.80	3.35	2.24	0.53
15	144	1617	1.60	2.20	0.94	3.95	2.67	0.65
15.5	145	1697	1.67	2.29	1.00	4.13	2.79	0.69
16	146	2017	1.99	2.70	1.22	4.85	3.29	0.85
16.5	147	2119	2.09	2.82	1.30	5.10	3.48	0.88
17	149	2452	2.42	3.26	1.51	5.86	4.05	1.02
17.5	150	2561	2.53	3.38	1.59	6.11	4.24	1.07
18	151	2955	2.92	3.87	1.88	7.01	4.89	1.25
18.5	152	3082	3.04	4.00	1.99	7.30	5.12	1.30
19	153	3532	3.48	4.59	2.28	8.30	5.97	1.49
19.5	154	3691	3.64	4.78	2.41	8.65	6.29	1.55
20	156	4193	4.14	5.41	2.75	9.73	7.13	1.78
20.5	157	4400	4.34	5.65	2.92	10.19	7.47	1.89
21	158	4991	4.92	6.39	3.33	11.49	8.47	2.17
21.5	159	5202	5.13	6.63	3.51	11.88	8.86	2.27
22	160	5851	5.77	7.44	3.96	13.24	9.95	2.59
22.5	161	6084	6.00	7.73	4.13	13.65	10.40	2.71
23	162	6789	6.70	8.61	4.63	15.16	11.60	3.05
23.5	164	7040	6.95	8.88	4.85	15.54	12.08	3.21
24	165	7826	7.72	9.85	5.42	17.01	13.37	3.66
24.5	166	8137	8.03	10.20	5.68	17.55	13.89	3.86
25	167	9015	8.89	11.17	6.44	19.33	15.30	4.34
25.5	168	9349	9.22	11.51	6.76	20.02	15.91	4.50
26	169	10258	10.12	12.67	7.38	21.79	17.40	5.00
26.5	170	10614	10.47	13.05	7.70	22.57	17.98	5.18
27	171	11659	11.50	14.24	8.56	24.40	19.56	5.86

LAL Grade 5

Raw Score	Scale Score	All Students		Male	Female	White	Afr.-A.	Hisp.
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
27.5	172	12053	11.89	14.65	8.93	25.19	20.20	6.08
28	174	13160	12.98	15.95	9.81	26.94	21.96	6.84
28.5	175	13632	13.45	16.48	10.20	27.78	22.68	7.13
29	176	14847	14.65	17.82	11.25	29.62	24.61	8.00
29.5	177	15362	15.16	18.38	11.70	30.42	25.54	8.30
30	178	16749	16.53	19.92	12.88	32.69	27.68	9.24
30.5	179	17277	17.05	20.52	13.33	33.52	28.54	9.60
31	180	18662	18.41	22.03	14.54	35.73	30.45	10.63
31.5	181	19237	18.98	22.67	15.03	36.65	31.26	11.05
32	182	20714	20.44	24.34	16.27	38.85	33.40	12.13
32.5	183	21335	21.05	24.97	16.86	39.73	34.32	12.59
33	184	22933	22.63	26.76	18.20	42.02	36.70	13.78
33.5	186	23640	23.32	27.48	18.87	43.09	37.63	14.34
34	187	25414	25.07	29.44	20.41	45.63	39.92	15.78
34.5	188	26119	25.77	30.21	21.03	46.61	40.86	16.34
35	189	28007	27.63	32.21	22.74	49.02	43.44	17.90
35.5	190	28742	28.36	32.98	23.42	49.90	44.51	18.50
36	191	30673	30.26	35.04	25.15	52.23	46.97	20.15
36.5	192	31489	31.07	35.85	25.95	53.22	47.93	20.89
37	193	33541	33.09	38.01	27.84	55.60	50.56	22.74
37.5	194	34366	33.91	38.86	28.61	56.64	51.62	23.44
38	195	36554	36.07	41.17	30.61	59.00	54.17	25.50
38.5	197	37452	36.95	42.06	31.50	59.97	55.27	26.34
39	198	39700	39.17	44.39	33.60	62.46	57.68	28.51
39.5	199	40630	40.09	45.35	34.47	63.53	58.69	29.41
40	200	42962	42.39	47.77	36.66	65.82	61.28	31.68
40.5	201	43942	43.35	48.75	37.60	66.75	62.32	32.66
41	202	46486	45.86	51.28	40.10	69.28	64.86	35.25
41.5	203	47482	46.85	52.27	41.07	70.17	65.86	36.28
42	205	50183	49.51	54.99	43.68	72.24	68.57	39.19
42.5	206	51213	50.53	55.97	44.74	73.15	69.57	40.27
43	207	53839	53.12	58.53	47.36	75.39	72.05	43.08
43.5	208	54924	54.19	59.54	48.50	76.28	73.07	44.28
44	209	57644	56.87	62.25	51.15	78.50	75.40	47.27
44.5	211	58765	57.98	63.28	52.34	79.24	76.57	48.50
45	212	61410	60.59	65.89	54.96	81.09	78.62	51.53
45.5	213	62574	61.74	66.93	56.22	81.88	79.60	52.87
46	214	65133	64.26	69.42	58.79	83.62	81.38	55.85
46.5	216	66312	65.43	70.47	60.07	84.35	82.26	57.23
47	217	69047	68.12	73.06	62.90	86.19	84.35	60.36
47.5	218	70282	69.34	74.18	64.21	87.04	85.17	61.80
48	220	72799	71.83	76.56	66.81	88.58	86.75	64.85
48.5	221	73940	72.95	77.60	68.03	89.29	87.43	66.22
49	222	76494	75.47	80.01	70.66	90.66	89.08	69.30
49.5	224	77692	76.65	81.06	71.99	91.31	89.86	70.76
50	225	80054	78.98	83.19	74.53	92.46	91.14	73.70
50.5	227	81141	80.06	84.15	75.72	93.00	91.74	75.02
51	228	83347	82.23	86.09	78.16	94.07	92.96	77.75

LAL Grade 5

Raw Score	Scale Score	All Students		Male	Female	White	Afr.-A.	Hisp.
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
51.5	230	84361	83.23	86.95	79.30	94.54	93.47	79.02
52	231	86351	85.20	88.62	81.57	95.53	94.48	81.47
52.5	233	87339	86.17	89.42	82.73	95.96	94.97	82.71
53	234	89170	87.98	91.00	84.78	96.60	95.90	84.95
53.5	236	90011	88.81	91.72	85.73	96.93	96.33	85.99
54	238	91652	90.43	93.03	87.67	97.44	97.00	88.08
54.5	239	92398	91.16	93.63	88.56	97.72	97.35	88.98
55	241	93867	92.61	94.80	90.30	98.21	97.91	90.85
55.5	243	94503	93.24	95.25	91.12	98.43	98.14	91.66
56	244	95664	94.39	96.14	92.54	98.76	98.59	93.09
56.5	246	96169	94.88	96.54	93.14	98.89	98.82	93.71
57	248	97176	95.88	97.19	94.49	99.16	99.09	95.00
57.5	250	97621	96.32	97.50	95.06	99.28	99.20	95.55
58	252	98343	97.03	98.02	95.99	99.46	99.42	96.46
58.5	254	98676	97.36	98.26	96.40	99.57	99.54	96.85
59	256	99290	97.96	98.65	97.24	99.71	99.69	97.57
59.5	258	99538	98.21	98.82	97.56	99.75	99.78	97.86
60	260	100004	98.67	99.15	98.16	99.82	99.86	98.43
60.5	263	100168	98.83	99.28	98.35	99.84	99.87	98.65
61	265	100481	99.14	99.49	98.77	99.90	99.91	99.03
61.5	267	100602	99.26	99.56	98.94	99.94	99.92	99.18
62	270	100813	99.47	99.67	99.25	99.95	99.95	99.42
62.5	272	100888	99.54	99.72	99.35	99.96	99.96	99.51
63	275	101040	99.69	99.81	99.57	99.97	99.97	99.68
63.5	278	101094	99.74	99.83	99.65	99.98	99.98	99.74
64	281	101170	99.82	99.87	99.76	99.98	99.99	99.82
64.5	284	101210	99.86	99.90	99.81	99.99	99.99	99.86
65	287	101271	99.92	99.94	99.90	99.99	100.00	99.92
65.5	290	101287	99.93	99.95	99.92	99.99	100.00	99.94
66	294	101322	99.97	99.97	99.97	99.99	100.00	99.97
66.5	297	101330	99.98	99.98	99.98	99.99	100.00	99.98
67	300	101354	100.00	100.00	100.00	100.00	100.00	100.00

*All cumulative distributions include students scored on the full set of items.

LAL Grade 6

Raw Score	Scale Score	All Students		Male	Female	White	Afr.-A.	Hisp.
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
0	100	27	0.03	0.03	0.02	0.07	0.03	0.01
4	103	48	0.05	0.07	0.03	0.12	0.07	0.01
4.5	106	50	0.05	0.07	0.03	0.13	0.07	0.01
5	109	66	0.06	0.09	0.04	0.17	0.11	0.02
6	114	101	0.10	0.13	0.06	0.24	0.21	0.02
6.5	116	104	0.10	0.14	0.06	0.25	0.21	0.02
7	118	164	0.16	0.22	0.10	0.38	0.30	0.05
7.5	120	173	0.17	0.23	0.10	0.42	0.31	0.05
8	121	253	0.25	0.34	0.14	0.60	0.45	0.09
8.5	123	267	0.26	0.35	0.16	0.62	0.49	0.09
9	125	383	0.38	0.52	0.22	0.97	0.66	0.13
9.5	126	401	0.39	0.54	0.23	1.02	0.69	0.13
10	128	555	0.54	0.76	0.31	1.35	0.99	0.19
10.5	129	579	0.57	0.79	0.33	1.41	1.04	0.20
11	130	719	0.70	0.98	0.41	1.77	1.25	0.25
11.5	132	751	0.74	1.03	0.42	1.84	1.30	0.27
12	133	935	0.92	1.27	0.54	2.23	1.72	0.32
12.5	134	974	0.95	1.32	0.57	2.30	1.82	0.34
13	136	1174	1.15	1.58	0.68	2.77	2.19	0.41
13.5	137	1229	1.20	1.64	0.73	2.92	2.29	0.43
14	138	1484	1.45	1.99	0.88	3.48	2.76	0.53
14.5	139	1552	1.52	2.08	0.91	3.64	2.88	0.56
15	140	1811	1.77	2.41	1.08	4.23	3.38	0.65
15.5	142	1879	1.84	2.49	1.14	4.37	3.53	0.68
16	143	2216	2.17	2.91	1.37	5.09	4.19	0.82
16.5	144	2316	2.27	3.02	1.45	5.29	4.38	0.86
17	145	2643	2.59	3.45	1.66	5.94	5.08	0.99
17.5	146	2750	2.69	3.57	1.75	6.16	5.31	1.03
18	147	3125	3.06	4.04	2.00	7.00	6.01	1.17
18.5	149	3263	3.20	4.21	2.10	7.31	6.28	1.23
19	150	3663	3.59	4.71	2.38	8.19	7.00	1.42
19.5	151	3798	3.72	4.86	2.49	8.56	7.19	1.47
20	152	4282	4.20	5.44	2.86	9.50	8.04	1.73
20.5	153	4432	4.34	5.59	2.99	9.81	8.33	1.80
21	154	4971	4.87	6.22	3.41	11.01	9.31	2.03
21.5	155	5117	5.01	6.37	3.54	11.33	9.55	2.10
22	157	5727	5.61	7.05	4.06	12.81	10.60	2.35
22.5	158	5917	5.80	7.26	4.21	13.25	10.92	2.44
23	159	6558	6.43	8.06	4.66	14.67	12.03	2.72
23.5	160	6756	6.62	8.25	4.85	15.11	12.40	2.80
24	161	7460	7.31	9.02	5.45	16.56	13.67	3.14
24.5	162	7712	7.56	9.27	5.70	17.09	14.07	3.27
25	163	8449	8.28	10.09	6.31	18.59	15.32	3.66
25.5	165	8700	8.53	10.33	6.56	19.10	15.75	3.78
26	166	9530	9.34	11.28	7.23	20.82	17.26	4.17

LAL Grade 6

Raw Score	Scale Score	All Students		Male	Female	White	Afr.-A.	Hisp.
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
26.5	167	9858	9.66	11.62	7.53	21.43	17.87	4.33
27	168	10760	10.54	12.59	8.32	23.20	19.38	4.80
27.5	169	11124	10.90	12.94	8.68	23.91	20.04	4.98
28	170	12091	11.85	14.03	9.48	25.78	21.60	5.52
28.5	171	12494	12.24	14.42	9.88	26.46	22.37	5.74
29	172	13473	13.20	15.53	10.68	28.36	23.97	6.29
29.5	174	13936	13.66	15.98	11.13	29.21	24.78	6.55
30	175	15076	14.77	17.19	12.14	31.36	26.56	7.23
30.5	176	15595	15.28	17.69	12.65	32.34	27.32	7.56
31	177	16803	16.47	18.95	13.75	34.34	29.17	8.36
31.5	178	17398	17.05	19.55	14.32	35.30	30.18	8.72
32	179	18649	18.28	20.89	15.42	37.51	31.95	9.55
32.5	180	19264	18.88	21.48	16.04	38.47	32.85	9.97
33	181	20715	20.30	23.09	17.27	40.87	34.87	11.03
33.5	182	21414	20.99	23.76	17.97	42.06	35.88	11.51
34	183	22883	22.43	25.36	19.23	44.30	37.80	12.65
34.5	185	23613	23.14	26.07	19.95	45.35	38.88	13.18
35	186	25346	24.84	27.99	21.42	47.79	41.03	14.59
35.5	187	26205	25.68	28.83	22.27	49.00	42.23	15.25
36	188	27878	27.32	30.58	23.79	51.46	44.29	16.61
36.5	189	28738	28.16	31.44	24.61	52.57	45.43	17.32
37	190	30541	29.93	33.39	26.17	54.67	47.99	18.83
37.5	191	31558	30.93	34.36	27.20	55.83	49.36	19.71
38	192	33555	32.88	36.50	28.97	58.23	51.77	21.46
38.5	193	34609	33.92	37.53	30.00	59.48	52.94	22.41
39	194	36810	36.07	39.81	32.04	61.92	55.54	24.48
39.5	196	37943	37.18	41.00	33.07	63.15	56.85	25.56
40	197	40195	39.39	43.29	35.18	65.67	59.29	27.68
40.5	198	41450	40.62	44.56	36.38	66.88	60.75	28.87
41	199	43801	42.92	47.01	38.52	69.04	63.09	31.31
41.5	200	45124	44.22	48.40	39.74	70.36	64.35	32.65
42	201	47625	46.67	50.92	42.12	72.69	66.93	35.15
42.5	202	48968	47.99	52.18	43.49	73.84	68.30	36.54
43	203	51580	50.55	54.86	45.93	76.00	70.79	39.31
43.5	205	52970	51.91	56.18	47.34	77.17	72.13	40.77
44	206	55685	54.57	58.90	49.94	79.39	74.61	43.70
44.5	207	57114	55.97	60.25	51.40	80.49	75.85	45.27
45	208	59777	58.58	62.84	54.03	82.38	78.13	48.23
45.5	209	61289	60.06	64.26	55.58	83.45	79.30	49.96
46	211	63967	62.69	66.90	58.20	85.14	81.35	53.05
46.5	212	65458	64.15	68.27	59.75	86.01	82.54	54.78
47	213	68126	66.76	70.85	62.42	87.60	84.44	57.91
47.5	214	69685	68.29	72.35	63.97	88.49	85.46	59.76
48	216	72237	70.79	74.78	66.56	89.81	87.02	62.94
48.5	217	73737	72.26	76.15	68.13	90.56	87.97	64.77
49	218	76294	74.77	78.58	70.72	91.70	89.48	67.92
49.5	219	77731	76.18	79.81	72.32	92.34	90.26	69.75

LAL Grade 6

Raw Score	Scale Score	All Students		Male	Female	White	Afr.-A.	Hisp.
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
50	221	80023	78.42	81.89	74.75	93.46	91.62	72.58
50.5	222	81343	79.72	83.04	76.19	94.06	92.35	74.18
51	224	83606	81.93	85.11	78.57	95.12	93.50	76.99
51.5	225	84898	83.20	86.24	79.98	95.56	94.15	78.59
52	226	86840	85.10	87.92	82.12	96.24	95.11	81.05
52.5	228	88059	86.30	88.98	83.46	96.57	95.65	82.58
53	229	89838	88.04	90.50	85.44	97.18	96.42	84.84
53.5	231	90907	89.09	91.36	86.68	97.51	96.85	86.15
54	232	92466	90.62	92.66	88.46	97.96	97.42	88.13
54.5	234	93373	91.50	93.39	89.51	98.24	97.70	89.33
55	236	94692	92.80	94.45	91.04	98.55	98.13	91.05
55.5	237	95561	93.65	95.15	92.05	98.78	98.36	92.14
56	239	96585	94.65	96.01	93.22	99.01	98.64	93.44
56.5	241	97253	95.31	96.54	94.00	99.16	98.89	94.25
57	243	98068	96.11	97.14	95.01	99.34	99.10	95.27
57.5	244	98582	96.61	97.53	95.63	99.44	99.22	95.93
58	246	99236	97.25	98.03	96.42	99.58	99.40	96.73
58.5	248	99625	97.63	98.30	96.92	99.70	99.52	97.19
59	250	100114	98.11	98.65	97.54	99.76	99.66	97.78
59.5	252	100426	98.42	98.87	97.93	99.78	99.72	98.16
60	254	100771	98.75	99.13	98.35	99.83	99.81	98.58
60.5	256	100980	98.96	99.28	98.62	99.85	99.85	98.83
61	258	101214	99.19	99.44	98.92	99.87	99.90	99.11
61.5	260	101351	99.32	99.55	99.08	99.90	99.92	99.27
62	262	101518	99.49	99.66	99.30	99.92	99.94	99.44
62.5	264	101628	99.59	99.74	99.44	99.94	99.96	99.57
63	267	101731	99.70	99.80	99.58	99.96	99.98	99.68
63.5	269	101801	99.76	99.85	99.68	99.98	99.99	99.74
64	271	101872	99.83	99.88	99.78	99.98	100.00	99.83
64.5	273	101909	99.87	99.91	99.83	99.99	100.00	99.87
65	275	101942	99.90	99.93	99.87	99.99	100.00	99.91
65.5	278	101958	99.92	99.94	99.89	100.00	100.00	99.92
66	280	101976	99.94	99.96	99.91	100.00	100.00	99.94
66.5	282	101993	99.95	99.97	99.94	100.00	100.00	99.95
67	284	102005	99.96	99.98	99.95	100.00	100.00	99.97
67.5	287	102013	99.97	99.98	99.96	100.00	100.00	99.98
68	289	102018	99.98	99.98	99.97	100.00	100.00	99.98
68.5	291	102020	99.98	99.99	99.98	100.00	100.00	99.98
69	294	102026	99.98	99.99	99.98	100.00	100.00	99.99
69.5	296	102031	99.99	99.99	99.98	100.00	100.00	99.99
70	299	102036	99.99	100.00	99.99	100.00	100.00	99.99
70.5	300	102042	100.00	100.00	100.00	100.00	100.00	100.00

*All cumulative distributions include students scored on the full set of items.

LAL Grade 7

Raw Score	Scale Score	All Students Cumulative* #	All Students Cumulative* %	Male Cumul. %	Female Cumul. %	White Cumul. %	Afr.-A. Cumul. %	Hisp. Cumul. %
0	100	72	0.07	0.11	0.04	0.11	0.09	0.04
6	106	94	0.09	0.12	0.05	0.17	0.12	0.04
6.5	109	95	0.09	0.12	0.05	0.17	0.13	0.04
7	112	141	0.13	0.14	0.08	0.26	0.20	0.07
7.5	114	146	0.14	0.14	0.09	0.29	0.20	0.07
8	116	195	0.18	0.14	0.11	0.41	0.31	0.07
8.5	119	207	0.19	0.14	0.11	0.46	0.32	0.08
9	121	287	0.27	0.16	0.16	0.71	0.39	0.11
9.5	123	294	0.27	0.16	0.17	0.74	0.40	0.11
10	124	373	0.35	0.17	0.22	0.95	0.55	0.12
10.5	126	383	0.36	0.17	0.23	0.97	0.57	0.13
11	128	499	0.47	0.17	0.29	1.28	0.74	0.17
11.5	130	519	0.49	0.17	0.30	1.34	0.77	0.17
12	131	645	0.60	0.22	0.37	1.70	0.96	0.21
12.5	133	671	0.63	0.23	0.38	1.76	1.01	0.21
13	134	799	0.75	0.27	0.43	2.02	1.23	0.26
13.5	135	847	0.79	0.32	0.46	2.16	1.27	0.29
14	137	1010	0.94	0.38	0.56	2.52	1.58	0.34
14.5	138	1061	0.99	0.38	0.59	2.61	1.67	0.36
15	140	1256	1.17	0.41	0.68	3.12	1.99	0.42
15.5	141	1331	1.24	0.42	0.74	3.36	2.07	0.44
16	142	1579	1.48	0.48	0.87	3.95	2.45	0.54
16.5	144	1652	1.54	0.49	0.92	4.10	2.55	0.58
17	145	1922	1.80	0.58	1.09	4.77	2.95	0.68
17.5	146	2028	1.90	0.62	1.16	4.99	3.11	0.73
18	147	2317	2.17	0.65	1.33	5.66	3.62	0.84
18.5	149	2439	2.28	0.67	1.40	5.98	3.80	0.89
19	150	2764	2.58	0.70	1.60	6.69	4.35	1.02
19.5	151	2916	2.73	0.74	1.70	7.03	4.56	1.10
20	152	3322	3.11	0.84	1.95	8.02	5.17	1.26
20.5	154	3488	3.26	0.85	2.04	8.41	5.44	1.33
21	155	3899	3.65	0.99	2.30	9.26	6.04	1.53
21.5	156	4104	3.84	1.03	2.45	9.77	6.39	1.60
22	157	4570	4.27	1.13	2.74	10.86	7.17	1.77
22.5	159	4800	4.49	1.24	2.90	11.30	7.53	1.89
23	160	5405	5.05	1.47	3.31	12.58	8.48	2.17
23.5	161	5655	5.29	1.53	3.50	13.08	8.84	2.31
24	162	6233	5.83	1.71	3.91	14.25	9.77	2.58
24.5	164	6489	6.07	1.79	4.11	14.80	10.16	2.70
25	165	7168	6.70	1.95	4.60	16.18	11.34	3.01
25.5	166	7473	6.99	2.07	4.84	16.71	11.81	3.18
26	167	8128	7.60	2.24	5.33	18.19	12.81	3.47
26.5	169	8477	7.93	2.36	5.61	18.96	13.36	3.62
27	170	9221	8.62	2.57	6.17	20.48	14.55	3.97
27.5	171	9619	8.99	2.70	6.55	21.31	15.24	4.14
28	172	10499	9.82	2.93	7.23	23.04	16.63	4.58

LAL Grade 7

Raw Score	Scale Score	All Students Cumulative* #	All Students Cumulative* %	Male Cumul. %	Female Cumul. %	White Cumul. %	Afr.-A. Cumul. %	Hisp. Cumul. %
28.5	174	10953	10.24	3.10	7.62	23.97	17.30	4.80
29	175	11914	11.14	3.49	8.37	25.74	18.88	5.29
29.5	176	12387	11.58	3.67	8.75	26.59	19.66	5.54
30	177	13394	12.52	4.15	9.54	28.34	21.20	6.11
30.5	178	13946	13.04	4.32	10.03	29.44	22.11	6.37
31	180	15009	14.03	4.69	10.86	31.16	23.74	7.02
31.5	181	15574	14.56	4.90	11.37	32.14	24.70	7.32
32	182	16665	15.58	5.31	12.24	33.91	26.30	8.03
32.5	183	17267	16.15	5.69	12.77	34.93	27.19	8.38
33	185	18468	17.27	6.11	13.78	36.83	28.98	9.14
33.5	186	19155	17.91	6.28	14.39	37.96	30.05	9.57
34	187	20566	19.23	6.82	15.57	40.15	32.02	10.52
34.5	189	21326	19.94	7.04	16.30	41.31	33.16	11.02
35	190	22797	21.32	7.64	17.52	43.50	35.29	12.01
35.5	191	23623	22.09	7.89	18.27	44.81	36.42	12.58
36	192	25220	23.58	8.72	19.63	47.02	38.67	13.70
36.5	194	26150	24.45	9.33	20.45	48.27	39.81	14.41
37	195	27811	26.01	10.17	21.91	50.48	42.02	15.66
37.5	196	28792	26.92	10.69	22.79	51.88	43.16	16.42
38	197	30551	28.57	11.72	24.28	54.12	45.21	17.84
38.5	199	31555	29.51	12.35	25.17	55.31	46.57	18.62
39	200	33507	31.33	13.42	26.90	57.56	48.99	20.23
39.5	201	34597	32.35	13.94	27.93	58.88	50.37	21.10
40	203	36645	34.27	15.21	29.74	61.13	52.93	22.80
40.5	204	37811	35.36	15.97	30.81	62.46	54.23	23.80
41	205	40010	37.41	17.54	32.77	64.84	56.78	25.68
41.5	207	41304	38.62	18.33	34.00	66.26	58.11	26.85
42	208	43466	40.64	19.89	35.91	68.39	60.42	28.82
42.5	209	44800	41.89	20.68	37.18	69.63	61.87	30.08
43	211	47089	44.03	22.41	39.25	71.90	64.11	32.22
43.5	212	48460	45.31	23.23	40.58	73.15	65.46	33.55
44	213	50863	47.56	25.05	42.80	75.10	67.76	35.92
44.5	215	52318	48.92	26.11	44.14	76.13	69.28	37.37
45	216	54726	51.17	28.02	46.27	78.08	71.44	39.79
45.5	218	56256	52.60	29.03	47.73	79.20	72.79	41.38
46	219	58741	54.93	30.91	50.05	80.85	74.99	43.98
46.5	221	60271	56.36	32.18	51.49	81.81	76.29	45.63
47	222	62758	58.68	34.41	53.91	83.19	78.28	48.34
47.5	224	64353	60.18	35.83	55.46	84.02	79.60	50.09
48	225	66947	62.60	38.25	57.96	85.60	81.65	52.89
48.5	227	68537	64.09	39.59	59.53	86.51	82.87	54.66
49	228	70983	66.38	41.83	61.86	87.82	84.71	57.37
49.5	230	72618	67.90	43.63	63.45	88.67	85.88	59.18
50	232	75076	70.20	46.17	65.78	89.87	87.37	62.04
50.5	233	76613	71.64	47.81	67.28	90.68	88.24	63.82
51	235	79049	73.92	50.41	69.70	91.80	89.62	66.69
51.5	237	80586	75.36	52.25	71.25	92.57	90.36	68.50

LAL Grade 7

Raw Score	Scale Score	All Students Cumulative* #	All Students Cumulative* %	Male Cumul. %	Female Cumul. %	White Cumul. %	Afr.-A. Cumul. %	Hisp. Cumul. %
52	239	82912	77.53	55.01	73.54	93.75	91.47	71.23
52.5	240	84377	78.90	56.90	75.05	94.37	92.20	72.96
53	242	86498	80.88	59.53	77.17	95.07	93.33	75.51
53.5	244	87874	82.17	61.58	78.61	95.53	94.04	77.12
54	246	89918	84.08	64.38	80.66	96.21	94.95	79.61
54.5	248	91258	85.33	66.24	82.04	96.63	95.53	81.25
55	250	93039	87.00	68.95	83.86	97.16	96.21	83.43
55.5	252	94175	88.06	71.07	85.02	97.44	96.56	84.82
56	254	95857	89.64	74.08	86.78	97.83	97.21	86.85
56.5	256	96855	90.57	75.96	87.86	98.10	97.59	88.04
57	259	98240	91.86	78.39	89.43	98.42	97.97	89.76
57.5	261	99139	92.70	79.93	90.50	98.61	98.24	90.88
58	263	100340	93.83	82.56	91.84	98.89	98.60	92.31
58.5	266	101116	94.55	84.06	92.76	99.05	98.84	93.25
59	268	102183	95.55	86.53	94.06	99.29	99.07	94.53
59.5	271	102772	96.10	87.75	94.76	99.38	99.24	95.25
60	274	103565	96.84	89.78	95.70	99.57	99.41	96.16
60.5	276	104020	97.27	90.90	96.25	99.63	99.53	96.69
61	279	104637	97.85	92.54	97.00	99.75	99.65	97.41
61.5	282	105000	98.18	93.58	97.45	99.79	99.71	97.84
62	285	105457	98.61	94.82	98.04	99.84	99.78	98.38
62.5	288	105699	98.84	95.41	98.36	99.87	99.84	98.68
63	291	105993	99.11	96.32	98.75	99.92	99.90	99.00
63.5	295	106159	99.27	96.92	98.95	99.92	99.92	99.18
64	298	106402	99.50	97.78	99.26	99.93	99.94	99.46
64.5	300	106941	100.00	100.00	100.00	100.00	100.00	100.00

*All cumulative distributions include students scored on the full set of items.

LAL Grade 8

Raw Score	Scale Score	All Students		Male	Female	White	Afr.-A.	Hisp.
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
0	100	33	0.03	0.04	0.02	0.03	0.04	0.02
3	108	37	0.04	0.04	0.02	0.04	0.06	0.02
3.5	111	38	0.04	0.04	0.03	0.04	0.06	0.02
4	115	47	0.04	0.06	0.03	0.06	0.07	0.03
5	121	63	0.06	0.08	0.04	0.10	0.07	0.04
6	125	78	0.07	0.10	0.04	0.14	0.09	0.04
6.5	128	80	0.08	0.10	0.04	0.15	0.10	0.04
7	129	111	0.11	0.16	0.05	0.21	0.15	0.06
7.5	131	114	0.11	0.16	0.05	0.22	0.15	0.06
8	133	164	0.16	0.23	0.07	0.33	0.21	0.08
9	136	227	0.21	0.31	0.11	0.49	0.34	0.09
9.5	138	229	0.22	0.31	0.11	0.49	0.35	0.09
10	139	286	0.27	0.39	0.14	0.61	0.46	0.11
10.5	140	292	0.28	0.40	0.14	0.63	0.47	0.11
11	142	362	0.34	0.50	0.16	0.79	0.59	0.13
11.5	143	367	0.35	0.51	0.17	0.80	0.60	0.14
12	144	449	0.43	0.61	0.21	1.01	0.70	0.17
12.5	145	463	0.44	0.63	0.23	1.06	0.72	0.17
13	146	578	0.55	0.80	0.26	1.33	0.90	0.22
13.5	147	591	0.56	0.82	0.27	1.35	0.92	0.23
14	148	703	0.67	0.98	0.32	1.60	1.08	0.28
14.5	149	723	0.68	1.01	0.32	1.66	1.11	0.28
15	150	848	0.80	1.17	0.40	1.93	1.30	0.34
15.5	151	872	0.83	1.20	0.42	2.00	1.33	0.34
16	152	1013	0.96	1.39	0.49	2.28	1.57	0.41
16.5	153	1043	0.99	1.42	0.51	2.36	1.62	0.42
17	154	1201	1.14	1.64	0.59	2.73	1.90	0.47
17.5	155	1245	1.18	1.71	0.61	2.83	1.97	0.49
18	156	1416	1.34	1.94	0.69	3.27	2.24	0.54
19	157	1633	1.55	2.20	0.83	3.80	2.58	0.61
19.5	158	1692	1.60	2.27	0.88	3.95	2.64	0.63
20	159	1881	1.78	2.50	0.99	4.37	2.95	0.71
20.5	160	1938	1.84	2.56	1.03	4.49	3.05	0.73
21	161	2169	2.05	2.88	1.14	5.07	3.43	0.80
21.5	162	2223	2.11	2.95	1.18	5.20	3.52	0.82
22	163	2452	2.32	3.24	1.31	5.69	3.96	0.90
23	164	2771	2.62	3.63	1.52	6.36	4.50	1.02
23.5	165	2849	2.70	3.72	1.58	6.59	4.60	1.04
24	166	3155	2.99	4.12	1.75	7.26	5.08	1.17
24.5	167	3240	3.07	4.22	1.82	7.45	5.26	1.20
25	168	3558	3.37	4.61	2.03	8.14	5.73	1.34
25.5	169	3664	3.47	4.73	2.10	8.38	5.90	1.38
26	170	3980	3.77	5.12	2.31	9.08	6.36	1.52
26.5	171	4414	4.18	5.65	2.59	10.00	7.09	1.70
27	172	4541	4.30	5.80	2.68	10.30	7.29	1.75
27.5	173	4922	4.66	6.30	2.89	11.02	7.99	1.92

LAL Grade 8

Raw Score	Scale Score	All Students		Male	Female	White	Afr.-A.	Hisp.
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
28.5	174	5061	4.79	6.46	2.99	11.28	8.23	1.99
29	175	5480	5.19	6.96	3.28	12.03	8.99	2.18
29.5	176	5637	5.34	7.16	3.36	12.37	9.26	2.24
30	177	6077	5.75	7.70	3.64	13.33	9.93	2.43
31	178	6701	6.35	8.43	4.08	14.65	10.95	2.69
31.5	179	6884	6.52	8.65	4.20	15.08	11.31	2.74
32	180	7410	7.02	9.28	4.56	16.16	12.20	2.98
32.5	181	7628	7.22	9.51	4.73	16.55	12.60	3.08
33	182	8218	7.78	10.21	5.14	17.68	13.65	3.35
33.5	183	8437	7.99	10.46	5.31	18.13	14.04	3.43
34	184	9048	8.57	11.18	5.74	19.35	15.11	3.71
34.5	185	9283	8.79	11.45	5.91	19.76	15.52	3.82
35	186	9934	9.41	12.20	6.38	21.02	16.55	4.15
36	187	10969	10.39	13.40	7.11	22.89	18.19	4.71
36.5	188	11280	10.68	13.76	7.34	23.44	18.70	4.89
37	189	12146	11.50	14.81	7.91	25.08	20.13	5.31
37.5	190	12474	11.81	15.17	8.16	25.58	20.76	5.48
38	191	13352	12.64	16.20	8.80	27.19	22.18	5.94
38.5	192	13747	13.02	16.64	9.10	27.85	22.84	6.15
39	193	14878	14.09	17.96	9.90	29.77	24.64	6.77
39.5	194	15312	14.50	18.47	10.21	30.42	25.31	7.03
40	195	16501	15.63	19.86	11.05	32.51	27.11	7.72
40.5	196	16967	16.07	20.37	11.42	33.36	27.75	8.01
41	197	18241	17.27	21.86	12.32	35.49	29.64	8.77
41.5	198	18785	17.79	22.43	12.78	36.32	30.48	9.11
42	199	20229	19.16	24.03	13.90	38.68	32.36	10.07
42.5	200	20823	19.72	24.67	14.37	39.63	33.25	10.44
43	201	22351	21.17	26.40	15.52	42.05	35.44	11.42
43.5	202	23014	21.79	27.11	16.07	43.03	36.39	11.86
44	203	24807	23.49	29.14	17.42	45.81	38.72	13.10
44.5	204	25595	24.24	29.95	18.10	46.98	39.73	13.67
45	205	27537	26.08	32.12	19.59	49.70	42.17	15.16
45.5	206	28450	26.94	33.03	20.41	50.81	43.40	15.85
46	207	30648	29.02	35.37	22.21	53.81	46.14	17.53
46.5	209	31607	29.93	36.36	23.05	54.86	47.30	18.35
47	210	33960	32.16	38.82	25.03	57.97	50.03	20.27
47.5	211	35148	33.28	40.03	26.06	59.21	51.55	21.29
48	212	37865	35.86	42.89	28.35	61.84	54.91	23.70
48.5	213	39041	36.97	44.09	29.36	63.18	56.33	24.66
49	214	41949	39.72	47.07	31.88	66.13	59.24	27.41
49.5	216	43295	41.00	48.47	33.04	67.54	60.74	28.61
50	217	46418	43.96	51.57	35.84	70.25	63.98	31.66
50.5	218	47830	45.29	52.93	37.16	71.49	65.53	32.99
51	219	51223	48.51	56.24	40.27	74.32	68.66	36.45
51.5	221	52727	49.93	57.72	41.64	75.68	70.17	37.92
52	222	56406	53.41	61.23	45.10	78.34	73.29	41.87
52.5	224	57940	54.87	62.75	46.48	79.61	74.80	43.37

LAL Grade 8

Raw Score	Scale Score	All Students Cumulative* #	All Students Cumulative* %	Male Cumul. %	Female Cumul. %	White Cumul. %	Afr.-A. Cumul. %	Hisp. Cumul. %
53	225	61772	58.50	66.27	50.22	82.22	77.71	47.58
53.5	226	63296	59.94	67.72	51.65	83.36	79.07	49.16
54	228	67245	63.68	71.21	55.67	85.66	81.95	53.61
54.5	229	68789	65.14	72.68	57.12	86.59	83.15	55.30
55	231	72872	69.01	76.17	61.39	88.76	85.55	60.12
55.5	233	74351	70.41	77.55	62.81	89.55	86.55	61.79
56	234	78370	74.21	80.80	67.22	91.47	88.70	66.70
56.5	236	79754	75.52	82.03	68.62	92.23	89.57	68.28
57	238	83609	79.17	85.04	72.95	93.77	91.57	73.00
57.5	240	84883	80.38	86.05	74.37	94.29	92.37	74.49
58	242	88460	83.77	88.80	78.43	95.65	94.16	78.87
58.5	244	89615	84.86	89.62	79.82	96.08	94.69	80.28
59	246	92690	87.77	91.82	83.49	97.00	96.00	84.12
59.5	248	93663	88.69	92.53	84.64	97.25	96.41	85.35
60	250	96248	91.14	94.30	87.80	98.05	97.35	88.58
60.5	252	97091	91.94	94.83	88.88	98.30	97.64	89.61
61	255	99004	93.75	96.12	91.25	98.78	98.25	91.99
61.5	257	99711	94.42	96.55	92.17	98.92	98.48	92.87
62	260	101231	95.86	97.55	94.08	99.24	98.96	94.77
62.5	262	101764	96.37	97.86	94.78	99.32	99.10	95.44
63	265	102850	97.39	98.55	96.17	99.53	99.42	96.78
63.5	267	103245	97.77	98.76	96.72	99.59	99.54	97.25
64	270	103994	98.48	99.17	97.75	99.75	99.72	98.15
64.5	273	104248	98.72	99.30	98.10	99.77	99.77	98.45
65	276	104681	99.13	99.53	98.71	99.82	99.82	98.97
65.5	279	104834	99.27	99.61	98.91	99.83	99.87	99.15
66	282	105093	99.52	99.74	99.28	99.90	99.92	99.46
66.5	284	105198	99.62	99.80	99.43	99.91	99.94	99.58
67	287	105334	99.75	99.88	99.61	99.93	99.95	99.74
67.5	290	105389	99.80	99.92	99.67	99.95	99.95	99.80
68	293	105478	99.88	99.95	99.81	99.97	99.98	99.88
68.5	296	105503	99.91	99.96	99.85	99.97	99.98	99.91
69	299	105547	99.95	99.97	99.92	99.99	99.99	99.95
69.5	300	105602	100.00	100.00	100.00	100.00	100.00	100.00

*All cumulative distributions include students scored on the full set of items.

Math Grade 5

Raw Score	Scale Score	All Students		Male	Female	Afr.-A	Hisp.	White
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
0	100	37	0.04	0.05	0.03	0.08	0.08	0.01
4	109	93	0.09	0.12	0.06	0.24	0.19	0.02
5	117	188	0.18	0.23	0.13	0.44	0.36	0.07
6	125	341	0.34	0.42	0.23	0.86	0.57	0.12
7	131	585	0.57	0.71	0.42	1.44	0.96	0.23
8	137	968	0.95	1.18	0.70	2.30	1.60	0.40
9	142	1484	1.46	1.74	1.14	3.57	2.41	0.62
10	147	2051	2.02	2.38	1.60	4.90	3.30	0.87
11	151	2719	2.67	3.10	2.19	6.56	4.32	1.16
12	156	3472	3.41	3.89	2.86	8.37	5.54	1.49
13	160	4353	4.28	4.78	3.70	10.33	6.88	1.94
14	164	5365	5.27	5.80	4.66	12.66	8.31	2.49
15	167	6533	6.42	7.01	5.74	15.29	10.04	3.09
16	171	7857	7.72	8.38	6.97	17.82	12.08	3.88
17	174	9308	9.15	9.76	8.43	20.86	14.17	4.73
18	178	10898	10.71	11.27	10.06	24.00	16.53	5.68
19	181	12677	12.46	13.05	11.76	27.21	19.22	6.86
20	184	14547	14.30	14.87	13.63	30.46	22.01	8.10
21	188	16711	16.42	16.89	15.86	34.24	25.07	9.61
22	191	19057	18.73	19.11	18.25	38.22	28.39	11.30
23	194	21463	21.09	21.38	20.71	42.00	31.54	13.16
24	197	24061	23.64	23.85	23.35	45.90	34.83	15.29
25	200	26735	26.27	26.33	26.13	49.56	38.38	17.50
26	203	29561	29.05	28.99	29.03	53.41	41.89	19.93
27	206	32423	31.86	31.62	32.03	57.06	45.24	22.49
28	209	35469	34.86	34.46	35.19	60.45	48.73	25.41
29	212	38654	37.99	37.45	38.46	63.90	52.47	28.43
30	215	41892	41.17	40.52	41.76	67.38	56.04	31.61
31	219	45167	44.39	43.57	45.15	70.61	59.78	34.84
32	222	48606	47.77	46.86	48.63	73.58	63.61	38.35
33	225	52011	51.11	50.04	52.17	76.31	66.90	42.06
34	228	55445	54.49	53.28	55.68	78.92	70.33	45.80
35	232	59071	58.05	56.77	59.33	81.58	73.60	49.83
36	235	62576	61.49	60.16	62.82	83.89	76.52	53.86
37	238	66125	64.98	63.63	66.33	86.26	79.38	57.93
38	242	69768	68.56	67.18	69.95	88.34	82.24	62.27
39	246	73404	72.13	70.69	73.59	90.26	84.85	66.64
40	250	77031	75.70	74.26	77.15	92.07	87.39	71.02
41	254	80705	79.31	78.03	80.61	93.74	89.78	75.47
42	259	84258	82.80	81.66	83.96	95.17	91.98	79.77
43	264	87725	86.21	85.20	87.23	96.46	93.98	83.93
44	270	91011	89.44	88.71	90.17	97.59	95.56	87.92
45	277	94088	92.46	91.83	93.10	98.38	96.89	91.66
46	285	96748	95.07	94.60	95.56	99.00	98.15	94.71
47	295	98968	97.26	96.98	97.54	99.48	99.05	97.19
48	300	101760	100.00	100.00	100.00	100.00	100.00	100.00

Math Grade 6

Raw Score	Scale Score	All Students		Male	Female	Afr.-A	Hisp.	White
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
0	100	27	0.03	0.03	0.02	0.08	0.03	0.01
3	108	60	0.06	0.07	0.04	0.15	0.10	0.02
4	118	143	0.14	0.17	0.11	0.35	0.23	0.06
5	126	319	0.31	0.37	0.25	0.82	0.46	0.13
6	133	639	0.62	0.72	0.51	1.55	0.99	0.28
7	139	1101	1.07	1.24	0.88	2.68	1.66	0.51
8	144	1751	1.71	1.98	1.39	4.34	2.65	0.76
9	149	2585	2.52	2.87	2.11	6.31	3.94	1.15
10	153	3570	3.49	3.98	2.92	8.75	5.50	1.55
11	158	4602	4.49	5.07	3.82	11.19	7.15	2.00
12	161	5795	5.66	6.31	4.91	13.78	9.18	2.59
13	165	7070	6.90	7.59	6.12	16.58	11.25	3.21
14	168	8501	8.30	8.97	7.52	19.70	13.51	3.94
15	172	9988	9.75	10.47	8.91	22.81	15.96	4.72
16	175	11642	11.37	12.10	10.49	26.13	18.50	5.67
17	178	13409	13.09	13.89	12.15	29.51	21.27	6.72
18	181	15256	14.89	15.77	13.87	32.76	24.02	7.92
19	184	17210	16.80	17.63	15.82	36.08	26.89	9.27
20	187	19249	18.79	19.65	17.78	39.56	29.90	10.64
21	189	21541	21.03	21.81	20.09	43.13	33.14	12.33
22	192	23805	23.24	23.95	22.37	46.42	36.53	14.02
23	195	26284	25.66	26.29	24.87	49.93	39.94	15.98
24	197	28876	28.19	28.70	27.54	53.50	43.11	18.17
25	200	31593	30.85	31.28	30.26	57.19	46.59	20.45
26	203	34419	33.60	33.89	33.18	60.49	50.16	22.98
27	205	37357	36.47	36.66	36.14	63.77	53.65	25.69
28	208	40440	39.48	39.54	39.30	66.97	57.10	28.69
29	211	43522	42.49	42.37	42.49	70.08	60.47	31.69
30	213	46776	45.67	45.33	45.91	72.98	63.82	35.08
31	216	50193	49.00	48.49	49.43	76.04	67.14	38.63
32	219	53542	52.27	51.66	52.80	78.75	70.44	42.22
33	222	57052	55.70	54.99	56.34	81.32	73.62	46.09
34	225	60579	59.14	58.28	59.95	83.72	76.49	50.11
35	228	64206	62.69	61.63	63.69	86.10	79.67	54.16
36	231	67829	66.22	65.03	67.39	88.07	82.45	58.41
37	234	71452	69.76	68.44	71.07	90.13	84.90	62.73
38	238	74927	73.15	71.73	74.57	91.86	87.40	66.87
39	242	78439	76.58	75.12	78.05	93.39	89.64	71.16
40	246	81872	79.93	78.55	81.34	94.72	91.57	75.48
41	250	85126	83.11	81.70	84.54	95.89	93.21	79.50
42	255	88220	86.13	84.79	87.51	97.00	94.74	83.29
43	260	91220	89.06	87.70	90.46	97.84	96.27	86.95
44	266	93934	91.71	90.50	92.96	98.56	97.40	90.30
45	273	96371	94.09	93.09	95.13	99.11	98.35	93.17
46	281	98460	96.13	95.39	96.89	99.55	99.07	95.66
47	292	100111	97.74	97.27	98.22	99.79	99.58	97.58
48	300	102425	100.00	100.00	100.00	100.00	100.00	100.00

*All cumulative distributions include students scored on the full set of items.

Math Grade 7

Raw Score	Scale Score	All Students		Male	Female	Afr.-A	Hisp.	White
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
0	100	174	0.17	0.21	0.13	0.48	0.23	0.07
5	109	329	0.32	0.41	0.22	0.76	0.51	0.15
6	116	600	0.58	0.75	0.40	1.52	0.87	0.25
7	123	1039	1.01	1.25	0.74	2.60	1.46	0.45
8	129	1672	1.62	1.96	1.24	4.22	2.28	0.74
9	134	2542	2.46	2.90	1.97	6.33	3.59	1.11
10	139	3599	3.49	4.10	2.79	9.00	4.97	1.59
11	144	4826	4.67	5.45	3.81	11.87	6.75	2.18
12	148	6205	6.01	6.88	5.03	15.07	8.75	2.85
13	152	7672	7.43	8.46	6.27	18.45	10.79	3.60
14	156	9284	8.99	10.08	7.74	21.88	13.23	4.43
15	160	11009	10.66	11.78	9.37	25.22	15.86	5.43
16	164	12830	12.43	13.61	11.03	28.88	18.42	6.48
17	168	14783	14.32	15.53	12.88	32.64	21.21	7.63
18	171	16861	16.33	17.55	14.88	36.43	24.04	9.00
19	175	19088	18.49	19.73	17.00	40.14	27.15	10.56
20	178	21389	20.72	21.85	19.35	43.81	30.43	12.15
21	181	23815	23.06	24.11	21.79	47.62	33.89	13.85
22	184	26298	25.47	26.47	24.23	51.06	37.21	15.83
23	188	28790	27.88	28.79	26.74	54.47	40.23	17.93
24	191	31455	30.46	31.24	29.46	57.91	43.67	20.18
25	194	34194	33.12	33.73	32.29	61.03	47.23	22.55
26	197	37025	35.86	36.36	35.14	64.19	50.68	25.10
27	200	39868	38.61	39.06	37.96	67.14	54.24	27.73
28	203	42691	41.35	41.67	40.83	69.87	57.59	30.44
29	206	45680	44.24	44.44	43.86	72.71	60.73	33.45
30	209	48746	47.21	47.30	46.96	75.40	64.22	36.47
31	212	51831	50.20	50.21	50.03	77.79	67.37	39.70
32	215	54874	53.15	53.10	53.05	80.28	70.08	42.97
33	218	58000	56.17	56.04	56.19	82.44	73.08	46.41
34	221	61102	59.18	58.90	59.35	84.52	75.76	49.84
35	225	64198	62.18	61.67	62.59	86.34	78.56	53.32
36	228	67396	65.27	64.63	65.84	88.16	81.20	56.98
37	231	70571	68.35	67.63	69.01	89.80	83.73	60.66
38	235	73717	71.39	70.59	72.15	91.51	86.03	64.34
39	238	76830	74.41	73.53	75.25	92.69	88.28	68.15
40	242	79726	77.21	76.24	78.17	93.90	90.22	71.64
41	246	82736	80.13	79.06	81.20	95.05	92.02	75.32
42	250	85742	83.04	81.84	84.25	96.02	93.76	79.04
43	255	88595	85.80	84.64	86.99	96.91	95.17	82.61
44	259	91290	88.41	87.30	89.56	97.85	96.35	85.86
45	265	93861	90.90	89.94	91.89	98.53	97.41	89.06
46	271	96142	93.11	92.34	93.91	98.97	98.31	91.89
47	278	98215	95.12	94.42	95.85	99.39	98.94	94.38
48	287	100046	96.89	96.33	97.48	99.63	99.43	96.58
49	297	101461	98.26	97.96	98.59	99.81	99.73	98.15
50	300	103253	100.00	100.00	100.00	100.00	100.00	100.00

*All cumulative distributions include students scored on the full set of items.

Math Grade 8

Raw Score	Scale Score	All Students		Male	Female	Afr.-A	Hisp.	White
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
0	100	202	0.19	0.26	0.12	0.50	0.27	0.09
5	101	426	0.41	0.52	0.29	0.99	0.62	0.19
6	109	821	0.79	0.99	0.58	1.93	1.23	0.35
7	116	1386	1.33	1.66	0.97	3.40	2.12	0.55
8	122	2164	2.08	2.59	1.52	5.27	3.40	0.85
9	128	3024	2.91	3.58	2.17	7.17	4.80	1.22
10	133	3969	3.81	4.64	2.91	9.41	6.31	1.60
11	138	5012	4.82	5.80	3.74	12.11	7.81	2.01
12	142	6126	5.89	6.96	4.70	14.67	9.65	2.47
13	147	7304	7.02	8.17	5.75	17.44	11.59	2.95
14	151	8576	8.24	9.43	6.91	20.29	13.58	3.55
15	155	9865	9.48	10.69	8.13	22.99	15.61	4.21
16	158	11243	10.81	12.03	9.42	25.95	17.81	4.85
17	162	12687	12.19	13.37	10.86	28.84	20.19	5.60
18	165	14233	13.68	14.79	12.41	31.67	22.78	6.46
19	169	15743	15.13	16.20	13.89	34.60	24.97	7.35
20	172	17454	16.78	17.85	15.53	37.66	27.45	8.41
21	175	19241	18.49	19.42	17.40	40.78	30.12	9.53
22	178	21133	20.31	21.06	19.39	44.05	32.83	10.77
23	181	23059	22.16	22.77	21.39	47.16	35.63	12.07
24	185	25075	24.10	24.51	23.53	50.27	38.37	13.56
25	188	27139	26.08	26.29	25.72	53.33	41.12	15.14
26	191	29346	28.21	28.28	27.97	56.49	44.08	16.82
27	194	31651	30.42	30.36	30.34	59.41	46.98	18.74
28	197	34058	32.73	32.52	32.81	62.30	49.87	20.83
29	200	36566	35.15	34.73	35.44	65.05	52.90	23.13
30	203	39123	37.60	37.02	38.08	68.01	55.80	25.44
31	206	41917	40.29	39.48	41.00	70.76	59.11	28.04
32	209	44758	43.02	42.03	43.94	73.37	61.98	30.91
33	212	47696	45.84	44.61	47.01	75.83	65.04	33.89
34	216	50713	48.74	47.30	50.14	78.23	68.00	37.03
35	219	53954	51.86	50.15	53.54	80.65	71.00	40.47
36	222	57214	54.99	53.15	56.82	82.88	73.93	44.04
37	226	60533	58.18	56.14	60.22	85.00	76.61	47.77
38	229	64009	61.52	59.39	63.67	87.17	79.31	51.72
39	233	67566	64.94	62.69	67.22	88.96	82.04	55.89
40	237	71064	68.30	65.99	70.65	90.71	84.58	60.00
41	241	74631	71.73	69.30	74.22	92.38	87.06	64.24
42	245	78206	75.17	72.83	77.55	93.83	89.25	68.53
43	250	81819	78.64	76.34	81.00	95.15	91.37	72.98
44	255	85346	82.03	79.82	84.30	96.28	93.30	77.34
45	261	88743	85.30	83.30	87.35	97.32	94.87	81.63
46	268	92022	88.45	86.71	90.24	98.14	96.36	85.68
47	276	94949	91.26	89.86	92.70	98.76	97.59	89.30
48	286	97771	93.97	92.98	95.00	99.24	98.57	92.76
49	299	100180	96.29	95.67	96.93	99.59	99.21	95.68
50	300	104042	100.00	100.00	100.00	100.00	100.00	100.00

*All cumulative distributions include students scored on the full set of items.

Science Grade 8

Raw Score	Scale Score	All Students		Male	Female	Afr.-A	Hisp.	White
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
0	100	8	0.01	0.01	0.01	0.01	0.01	0.01
2	104	18	0.02	0.02	0.02	0.03	0.02	0.02
3	118	24	0.02	0.02	0.02	0.04	0.03	0.02
4	129	44	0.04	0.04	0.04	0.11	0.05	0.02
5	137	72	0.07	0.08	0.05	0.18	0.10	0.03
6	144	130	0.12	0.15	0.09	0.31	0.20	0.05
7	150	269	0.26	0.33	0.18	0.64	0.47	0.10
8	156	528	0.50	0.62	0.37	1.30	0.92	0.17
9	161	977	0.93	1.11	0.73	2.26	1.76	0.34
10	165	1622	1.55	1.84	1.22	3.81	2.88	0.54
11	169	2485	2.37	2.78	1.92	5.87	4.38	0.82
12	173	3579	3.42	3.86	2.92	8.30	6.35	1.24
13	177	4952	4.73	5.24	4.14	11.24	8.86	1.75
14	180	6571	6.28	6.82	5.64	14.72	11.72	2.38
15	184	8308	7.94	8.46	7.31	18.28	14.92	3.09
16	187	10263	9.80	10.23	9.27	21.97	18.58	3.96
17	190	12323	11.77	12.13	11.30	26.12	22.09	4.92
18	193	14530	13.88	14.13	13.51	30.39	25.57	6.09
19	196	16826	16.07	16.16	15.88	34.57	29.26	7.31
20	200	19208	18.35	18.26	18.33	38.91	32.66	8.75
21	202	21684	20.72	20.39	20.94	43.05	36.46	10.25
22	205	24226	23.14	22.56	23.63	47.12	40.16	11.93
23	208	26781	25.58	24.71	26.38	51.03	43.63	13.79
24	211	29506	28.19	27.09	29.21	54.73	47.18	15.92
25	214	32247	30.81	29.49	32.07	58.27	50.50	18.16
26	216	35048	33.48	31.94	34.97	61.78	53.98	20.48
27	219	38047	36.35	34.51	38.15	65.32	57.33	23.13
28	222	41037	39.20	37.13	41.25	68.24	60.79	25.86
29	225	44152	42.18	39.90	44.45	71.36	63.89	28.85
30	227	47365	45.25	42.88	47.61	74.18	67.07	32.05
31	230	50524	48.27	45.68	50.86	76.67	70.18	35.26
32	233	53720	51.32	48.53	54.13	79.29	72.77	38.71
33	236	57049	54.50	51.56	57.48	81.66	75.56	42.34
34	239	60589	57.88	54.90	60.91	83.98	78.45	46.23
35	241	63982	61.12	58.09	64.21	85.98	81.01	50.10
36	244	67430	64.42	61.38	67.51	88.05	83.51	54.00
37	247	70966	67.80	64.94	70.71	89.91	85.85	58.18
38	250	74373	71.05	68.30	73.87	91.47	87.98	62.26
39	253	77713	74.24	71.59	76.96	92.84	90.01	66.31
40	257	81049	77.43	74.95	79.97	94.25	91.85	70.34
41	260	84232	80.47	78.17	82.83	95.46	93.37	74.28
42	264	87370	83.47	81.41	85.58	96.42	94.76	78.23
43	267	90227	86.20	84.31	88.14	97.41	95.95	81.77
44	272	93047	88.89	87.29	90.54	98.13	96.84	85.38
45	276	95506	91.24	89.92	92.60	98.67	97.82	88.51
46	281	97796	93.43	92.35	94.54	99.08	98.53	91.44
47	287	99738	95.28	94.48	96.11	99.43	99.01	93.92
48	293	101385	96.86	96.27	97.46	99.66	99.39	96.01

Science Grade 8

Raw Score	Scale Score	All Students		Male	Female	Afr.-A	Hisp.	White
		Cumulative*		Cumul.	Cumul.	Cumul.	Cumul.	Cumul.
		#	%	%	%	%	%	%
49	300	104675	100.00	100.00	100.00	100.00	100.00	100.00

*All cumulative distributions include students scored on the full set of items.

APPENDIX F
RAW SCORE TO SCALE SCORE CONVERSION TABLES

LAL Grade 5 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-6.399	1.827	26	169	-0.804	0.197	52	231	1.381	0.232
0.5	100	-5.193	1.001	26.5	170	-0.765	0.197	52.5	233	1.435	0.234
1	100	-4.498	0.708	27	171	-0.726	0.197	53	234	1.491	0.236
1.5	100	-4.092	0.578	27.5	172	-0.687	0.197	53.5	236	1.547	0.238
2	100	-3.803	0.500	28	174	-0.649	0.196	54	238	1.604	0.241
2.5	100	-3.580	0.447	28.5	175	-0.610	0.196	54.5	239	1.663	0.243
3	100	-3.399	0.407	29	176	-0.572	0.196	55	241	1.723	0.246
3.5	100	-3.245	0.377	29.5	177	-0.533	0.196	55.5	243	1.784	0.248
4	104	-3.113	0.352	30	178	-0.495	0.196	56	244	1.846	0.251
4.5	107	-2.996	0.332	30.5	179	-0.456	0.196	56.5	246	1.910	0.254
5	110	-2.891	0.315	31	180	-0.418	0.196	57	248	1.975	0.257
5.5	113	-2.796	0.301	31.5	181	-0.380	0.196	57.5	250	2.043	0.261
6	115	-2.710	0.289	32	182	-0.342	0.196	58	252	2.111	0.264
6.5	117	-2.629	0.278	32.5	183	-0.303	0.196	58.5	254	2.182	0.268
7	119	-2.555	0.269	33	184	-0.265	0.196	59	256	2.255	0.271
7.5	121	-2.485	0.261	33.5	186	-0.227	0.196	59.5	258	2.330	0.275
8	123	-2.418	0.254	34	187	-0.188	0.196	60	260	2.407	0.280
8.5	125	-2.355	0.248	34.5	188	-0.150	0.196	60.5	263	2.486	0.284
9	127	-2.295	0.242	35	189	-0.111	0.197	61	265	2.568	0.288
9.5	128	-2.238	0.238	35.5	190	-0.072	0.197	61.5	267	2.652	0.293
10	130	-2.182	0.233	36	191	-0.034	0.197	62	270	2.740	0.298
10.5	131	-2.129	0.230	36.5	192	0.005	0.197	62.5	272	2.830	0.303
11	133	-2.077	0.226	37	193	0.044	0.198	63	275	2.924	0.309
11.5	134	-2.026	0.223	37.5	194	0.084	0.198	63.5	278	3.021	0.315
12	136	-1.977	0.221	38	195	0.123	0.199	64	281	3.123	0.322
12.5	137	-1.929	0.218	38.5	197	0.163	0.199	64.5	284	3.229	0.329
13	139	-1.882	0.216	39	198	0.202	0.200	65	287	3.340	0.337
13.5	140	-1.835	0.214	39.5	199	0.242	0.200	65.5	290	3.457	0.346
14	141	-1.790	0.213	40	200	0.283	0.201	66	294	3.580	0.356
14.5	142	-1.745	0.211	40.5	201	0.323	0.202	66.5	297	3.710	0.367
15	144	-1.701	0.210	41	202	0.364	0.202	67	300	3.849	0.379
15.5	145	-1.657	0.208	41.5	203	0.405	0.203	67.5	300	3.999	0.393
16	146	-1.614	0.207	42	205	0.447	0.204	68	300	4.160	0.409
16.5	147	-1.571	0.206	42.5	206	0.488	0.205	68.5	300	4.334	0.426
17	149	-1.529	0.205	43	207	0.530	0.206	69	300	4.524	0.446
17.5	150	-1.487	0.205	43.5	208	0.573	0.207	69.5	300	4.732	0.466
18	151	-1.445	0.204	44	209	0.616	0.208	70	300	4.959	0.487
18.5	152	-1.403	0.203	44.5	211	0.659	0.209	70.5	300	5.207	0.509
19	153	-1.362	0.203	45	212	0.703	0.210	71	300	5.477	0.531
19.5	154	-1.321	0.202	45.5	213	0.748	0.211	71.5	300	5.771	0.553
20	156	-1.280	0.202	46	214	0.793	0.212	72	300	6.091	0.577
20.5	157	-1.240	0.201	46.5	216	0.838	0.214	72.5	300	6.439	0.604
21	158	-1.199	0.201	47	217	0.884	0.215	73	300	6.825	0.640
21.5	159	-1.159	0.200	47.5	218	0.931	0.217	73.5	300	7.269	0.697
22	160	-1.119	0.200	48	220	0.978	0.218	74	300	7.822	0.802
22.5	161	-1.079	0.200	48.5	221	1.026	0.219	74.5	300	8.654	1.065
23	162	-1.040	0.199	49	222	1.074	0.221	75	300	9.948	1.860
23.5	164	-1.000	0.199	49.5	224	1.123	0.223				
24	165	-0.960	0.199	50	225	1.173	0.224				
24.5	166	-0.921	0.198	50.5	227	1.224	0.226				
25	167	-0.882	0.198	51	228	1.276	0.228				
25.5	168	-0.843	0.198	51.5	230	1.328	0.230				

LAL Grade 6 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-6.689	1.830	26.5	167	-0.838	0.209	53	229	1.575	0.242
0.5	100	-5.475	1.008	27	168	-0.795	0.208	53.5	231	1.634	0.244
1	100	-4.767	0.717	27.5	169	-0.752	0.208	54	232	1.694	0.246
1.5	100	-4.348	0.589	28	170	-0.708	0.208	54.5	234	1.756	0.249
2	100	-4.048	0.512	28.5	171	-0.665	0.207	55	236	1.818	0.252
2.5	100	-3.813	0.459	29	172	-0.622	0.207	55.5	237	1.882	0.254
3	100	-3.621	0.419	29.5	174	-0.580	0.207	56	239	1.948	0.257
3.5	100	-3.458	0.388	30	175	-0.537	0.207	56.5	241	2.014	0.260
4	103	-3.317	0.363	30.5	176	-0.494	0.206	57	243	2.083	0.263
4.5	106	-3.193	0.342	31	177	-0.452	0.206	57.5	244	2.152	0.266
5	109	-3.082	0.324	31.5	178	-0.409	0.206	58	246	2.224	0.268
5.5	111	-2.982	0.308	32	179	-0.367	0.206	58.5	248	2.296	0.271
6	114	-2.891	0.295	32.5	180	-0.325	0.206	59	250	2.371	0.274
6.5	116	-2.808	0.283	33	181	-0.282	0.205	59.5	252	2.446	0.276
7	118	-2.730	0.273	33.5	182	-0.240	0.205	60	254	2.524	0.279
7.5	120	-2.658	0.265	34	183	-0.198	0.205	60.5	256	2.602	0.281
8	121	-2.590	0.257	34.5	185	-0.156	0.205	61	258	2.682	0.283
8.5	123	-2.526	0.250	35	186	-0.114	0.205	61.5	260	2.763	0.285
9	125	-2.465	0.244	35.5	187	-0.072	0.205	62	262	2.845	0.287
9.5	126	-2.406	0.239	36	188	-0.029	0.205	62.5	264	2.927	0.288
10	128	-2.350	0.235	36.5	189	0.013	0.205	63	267	3.011	0.289
10.5	129	-2.296	0.231	37	190	0.055	0.206	63.5	269	3.095	0.290
11	130	-2.243	0.228	37.5	191	0.097	0.206	64	271	3.179	0.291
11.5	132	-2.192	0.225	38	192	0.140	0.206	64.5	273	3.264	0.291
12	133	-2.142	0.222	38.5	193	0.182	0.206	65	275	3.349	0.292
12.5	134	-2.093	0.220	39	194	0.225	0.207	65.5	278	3.434	0.292
13	136	-2.045	0.218	39.5	196	0.268	0.207	66	280	3.520	0.293
13.5	137	-1.998	0.217	40	197	0.311	0.207	66.5	282	3.606	0.294
14	138	-1.951	0.216	40.5	198	0.354	0.208	67	284	3.693	0.295
14.5	139	-1.905	0.214	41	199	0.397	0.208	67.5	287	3.780	0.297
15	140	-1.859	0.214	41.5	200	0.441	0.209	68	289	3.869	0.299
15.5	142	-1.814	0.213	42	201	0.484	0.210	68.5	291	3.959	0.302
16	143	-1.768	0.212	42.5	202	0.529	0.210	69	294	4.051	0.306
16.5	144	-1.723	0.212	43	203	0.573	0.211	69.5	296	4.146	0.310
17	145	-1.679	0.211	43.5	205	0.618	0.212	70	299	4.244	0.316
17.5	146	-1.634	0.211	44	206	0.663	0.213	70.5	300	4.346	0.324
18	147	-1.589	0.211	44.5	207	0.708	0.214	71	300	4.454	0.333
18.5	149	-1.545	0.211	45	208	0.754	0.215	71.5	300	4.568	0.344
19	150	-1.500	0.211	45.5	209	0.801	0.216	72	300	4.691	0.356
19.5	151	-1.456	0.211	46	211	0.847	0.217	72.5	300	4.823	0.372
20	152	-1.411	0.211	46.5	212	0.895	0.218	73	300	4.968	0.390
20.5	153	-1.367	0.211	47	213	0.943	0.220	73.5	300	5.128	0.411
21	154	-1.323	0.211	47.5	214	0.991	0.221	74	300	5.308	0.436
21.5	155	-1.278	0.211	48	216	1.040	0.222	74.5	300	5.511	0.466
22	157	-1.234	0.211	48.5	217	1.090	0.224	75	300	5.745	0.501
22.5	158	-1.190	0.210	49	218	1.141	0.226	75.5	300	6.017	0.544
23	159	-1.145	0.210	49.5	219	1.192	0.227	76	300	6.342	0.597
23.5	160	-1.101	0.210	50	221	1.244	0.229	76.5	300	6.741	0.670
24	161	-1.057	0.210	50.5	222	1.297	0.231	77	300	7.266	0.789
24.5	162	-1.013	0.210	51	224	1.351	0.233	77.5	300	8.082	1.060
25	163	-0.969	0.209	51.5	225	1.405	0.235	78	300	9.372	1.859
25.5	165	-0.926	0.209	52	226	1.461	0.237				
26	166	-0.882	0.209	52.5	228	1.518	0.239				

LAL Grade 7 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-6.626	1.830	26.5	169	-0.903	0.194	53	242	1.325	0.237
0.5	100	-5.411	1.008	27	170	-0.865	0.194	53.5	244	1.382	0.240
1	100	-4.702	0.718	27.5	171	-0.827	0.194	54	246	1.440	0.243
1.5	100	-4.282	0.590	28	172	-0.790	0.194	54.5	248	1.500	0.246
2	100	-3.980	0.514	28.5	174	-0.752	0.194	55	250	1.561	0.249
2.5	100	-3.743	0.462	29	175	-0.714	0.194	55.5	252	1.624	0.252
3	100	-3.548	0.423	29.5	176	-0.677	0.194	56	254	1.688	0.256
3.5	100	-3.382	0.393	30	177	-0.639	0.194	56.5	256	1.754	0.259
4	100	-3.237	0.369	30.5	178	-0.601	0.194	57	259	1.822	0.263
4.5	100	-3.109	0.348	31	180	-0.564	0.194	57.5	261	1.892	0.267
5	100	-2.994	0.331	31.5	181	-0.526	0.194	58	263	1.965	0.271
5.5	103	-2.889	0.316	32	182	-0.488	0.194	58.5	266	2.039	0.275
6	106	-2.794	0.302	32.5	183	-0.450	0.194	59	268	2.116	0.279
6.5	109	-2.706	0.290	33	185	-0.413	0.195	59.5	271	2.195	0.283
7	112	-2.625	0.280	33.5	186	-0.375	0.195	60	274	2.276	0.287
7.5	114	-2.550	0.270	34	187	-0.337	0.195	60.5	276	2.360	0.291
8	116	-2.479	0.261	34.5	189	-0.299	0.195	61	279	2.446	0.295
8.5	119	-2.413	0.253	35	190	-0.261	0.195	61.5	282	2.534	0.299
9	121	-2.351	0.246	35.5	191	-0.222	0.196	62	285	2.625	0.303
9.5	123	-2.292	0.240	36	192	-0.184	0.196	62.5	288	2.717	0.306
10	124	-2.236	0.234	36.5	194	-0.146	0.196	63	291	2.812	0.308
10.5	126	-2.182	0.228	37	195	-0.107	0.197	63.5	295	2.907	0.310
11	128	-2.131	0.224	37.5	196	-0.068	0.197	64	298	3.004	0.312
11.5	130	-2.082	0.219	38	197	-0.029	0.197	64.5	300	3.102	0.314
12	131	-2.035	0.216	38.5	199	0.010	0.198	65	300	3.201	0.315
12.5	133	-1.989	0.212	39	200	0.049	0.198	65.5	300	3.301	0.317
13	134	-1.945	0.209	39.5	201	0.088	0.199	66	300	3.402	0.319
13.5	135	-1.902	0.207	40	203	0.128	0.200	66.5	300	3.505	0.322
14	137	-1.859	0.204	40.5	204	0.168	0.200	67	300	3.610	0.325
14.5	138	-1.818	0.203	41	205	0.208	0.201	67.5	300	3.717	0.330
15	140	-1.777	0.201	41.5	207	0.249	0.202	68	300	3.828	0.336
15.5	141	-1.737	0.199	42	208	0.290	0.202	68.5	300	3.943	0.344
16	142	-1.698	0.198	42.5	209	0.331	0.203	69	300	4.065	0.355
16.5	144	-1.659	0.197	43	211	0.372	0.204	69.5	300	4.195	0.368
17	145	-1.620	0.196	43.5	212	0.414	0.205	70	300	4.337	0.385
17.5	146	-1.581	0.196	44	213	0.457	0.206	70.5	300	4.493	0.407
18	147	-1.543	0.195	44.5	215	0.499	0.207	71	300	4.669	0.434
18.5	149	-1.505	0.195	45	216	0.543	0.208	71.5	300	4.873	0.469
19	150	-1.467	0.194	45.5	218	0.586	0.210	72	300	5.112	0.511
19.5	151	-1.430	0.194	46	219	0.630	0.211	72.5	300	5.398	0.558
20	152	-1.392	0.194	46.5	221	0.675	0.212	73	300	5.736	0.603
20.5	154	-1.354	0.194	47	222	0.721	0.214	73.5	300	6.120	0.634
21	155	-1.317	0.194	47.5	224	0.766	0.215	74	300	6.534	0.649
21.5	156	-1.279	0.194	48	225	0.813	0.217	74.5	300	6.960	0.657
22	157	-1.241	0.194	48.5	227	0.860	0.218	75	300	7.397	0.666
22.5	159	-1.204	0.194	49	228	0.908	0.220	75.5	300	7.851	0.684
23	160	-1.166	0.194	49.5	230	0.957	0.222	76	300	8.340	0.719
23.5	161	-1.129	0.194	50	232	1.007	0.224	76.5	300	8.896	0.778
24	162	-1.091	0.194	50.5	233	1.057	0.226	77	300	9.577	0.882
24.5	164	-1.053	0.194	51	235	1.109	0.228	77.5	300	10.547	1.129
25	165	-1.016	0.194	51.5	237	1.161	0.230	78	300	11.939	1.896
25.5	166	-0.978	0.194	52	239	1.214	0.232				
26	167	-0.940	0.194	52.5	240	1.269	0.235				

LAL Grade 8 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-6.921	1.833	26.5	171	-0.977	0.197	53	225	1.460	0.254
0.5	100	-5.700	1.012	27	171	-0.938	0.198	53.5	226	1.525	0.257
1	100	-4.982	0.724	27.5	172	-0.899	0.198	54	228	1.592	0.260
1.5	100	-4.553	0.597	28	173	-0.860	0.198	54.5	229	1.661	0.264
2	100	-4.243	0.522	28.5	174	-0.821	0.198	55	231	1.732	0.268
2.5	103	-3.998	0.470	29	175	-0.782	0.198	55.5	233	1.805	0.272
3	108	-3.795	0.433	29.5	176	-0.742	0.198	56	234	1.880	0.276
3.5	111	-3.621	0.403	30	177	-0.703	0.199	56.5	236	1.957	0.281
4	115	-3.468	0.379	30.5	178	-0.663	0.199	57	238	2.037	0.285
4.5	118	-3.332	0.359	31	178	-0.624	0.199	57.5	240	2.120	0.290
5	121	-3.210	0.342	31.5	179	-0.584	0.199	58	242	2.206	0.295
5.5	123	-3.098	0.327	32	180	-0.544	0.200	58.5	244	2.294	0.300
6	125	-2.996	0.313	32.5	181	-0.504	0.200	59	246	2.386	0.306
6.5	128	-2.901	0.302	33	182	-0.464	0.200	59.5	248	2.481	0.311
7	129	-2.813	0.291	33.5	183	-0.424	0.201	60	250	2.580	0.316
7.5	131	-2.732	0.281	34	184	-0.383	0.201	60.5	252	2.682	0.322
8	133	-2.655	0.273	34.5	185	-0.343	0.202	61	255	2.787	0.327
8.5	135	-2.583	0.265	35	186	-0.302	0.202	61.5	257	2.896	0.332
9	136	-2.515	0.257	35.5	187	-0.261	0.203	62	260	3.008	0.337
9.5	138	-2.450	0.251	36	187	-0.220	0.203	62.5	262	3.123	0.341
10	139	-2.389	0.245	36.5	188	-0.179	0.204	63	265	3.241	0.346
10.5	140	-2.330	0.239	37	189	-0.137	0.204	63.5	267	3.361	0.349
11	142	-2.274	0.234	37.5	190	-0.095	0.205	64	270	3.484	0.352
11.5	143	-2.221	0.230	38	191	-0.053	0.206	64.5	273	3.609	0.355
12	144	-2.169	0.225	38.5	192	-0.010	0.206	65	276	3.735	0.356
12.5	145	-2.119	0.222	39	193	0.032	0.207	65.5	279	3.863	0.358
13	146	-2.070	0.218	39.5	194	0.075	0.208	66	282	3.991	0.358
13.5	147	-2.023	0.215	40	195	0.119	0.209	66.5	284	4.119	0.358
14	148	-1.977	0.213	40.5	196	0.163	0.210	67	287	4.248	0.359
14.5	149	-1.933	0.210	41	197	0.207	0.211	67.5	290	4.376	0.359
15	150	-1.889	0.208	41.5	198	0.252	0.212	68	293	4.506	0.360
15.5	151	-1.846	0.206	42	199	0.297	0.213	68.5	296	4.636	0.362
16	152	-1.804	0.205	42.5	200	0.342	0.214	69	299	4.768	0.366
16.5	153	-1.762	0.203	43	201	0.388	0.215	69.5	300	4.904	0.372
17	154	-1.721	0.202	43.5	202	0.435	0.216	70	300	5.045	0.381
17.5	155	-1.681	0.201	44	203	0.482	0.217	70.5	300	5.195	0.392
18	156	-1.640	0.200	44.5	204	0.529	0.219	71	300	5.355	0.408
18.5	157	-1.601	0.199	45	205	0.577	0.220	71.5	300	5.529	0.428
19	157	-1.561	0.199	45.5	206	0.626	0.222	72	300	5.722	0.451
19.5	158	-1.522	0.198	46	207	0.675	0.223	72.5	300	5.938	0.477
20	159	-1.482	0.198	46.5	209	0.726	0.225	73	300	6.178	0.502
20.5	160	-1.443	0.197	47	210	0.776	0.226	73.5	300	6.441	0.524
21	161	-1.404	0.197	47.5	211	0.828	0.228	74	300	6.725	0.541
21.5	162	-1.366	0.197	48	212	0.880	0.230	74.5	300	7.025	0.555
22	163	-1.327	0.197	48.5	213	0.933	0.232	75	300	7.342	0.571
22.5	164	-1.288	0.197	49	214	0.988	0.234	75.5	300	7.680	0.592
23	164	-1.249	0.197	49.5	216	1.043	0.236	76	300	8.049	0.626
23.5	165	-1.211	0.197	50	217	1.099	0.238	76.5	300	8.474	0.682
24	166	-1.172	0.197	50.5	218	1.156	0.240	77	300	9.007	0.790
24.5	167	-1.133	0.197	51	219	1.214	0.243	77.5	300	9.819	1.056
25	168	-1.094	0.197	51.5	221	1.273	0.245	78	300	11.102	1.855
25.5	169	-1.055	0.197	52	222	1.334	0.248				
26	170	-1.016	0.197	52.5	224	1.396	0.251				

Math Grade 5 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.451	1.837
1	100	-4.217	1.021
2	100	-3.481	0.737
3	100	-3.031	0.614
4	109	-2.699	0.543
5	117	-2.432	0.495
6	125	-2.204	0.460
7	131	-2.005	0.434
8	137	-1.826	0.413
9	142	-1.662	0.396
10	147	-1.511	0.382
11	151	-1.370	0.371
12	156	-1.236	0.361
13	160	-1.109	0.352
14	164	-0.988	0.344
15	167	-0.872	0.338
16	171	-0.759	0.332
17	174	-0.651	0.327
18	178	-0.545	0.323
19	181	-0.442	0.320
20	184	-0.340	0.317
21	188	-0.241	0.314
22	191	-0.143	0.312
23	194	-0.046	0.311
24	197	0.050	0.310
25	200	0.146	0.309
26	203	0.241	0.309
27	206	0.336	0.309
28	209	0.432	0.310
29	212	0.528	0.310
30	215	0.625	0.312
31	219	0.722	0.313
32	222	0.821	0.315
33	225	0.921	0.318
34	228	1.023	0.320
35	232	1.127	0.324
36	235	1.233	0.329
37	238	1.343	0.334
38	242	1.457	0.341
39	246	1.576	0.350
40	250	1.702	0.361
41	254	1.837	0.374
42	259	1.983	0.391
43	264	2.145	0.413
44	270	2.326	0.440
45	277	2.536	0.477
46	285	2.787	0.528
47	295	3.104	0.603
48	300	3.540	0.729
49	300	4.266	1.017
50	300	5.494	1.835

Math Grade 6 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.210	1.835
1	100	-3.983	1.016
2	100	-3.257	0.730
3	108	-2.818	0.605
4	118	-2.497	0.532
5	126	-2.241	0.483
6	133	-2.025	0.447
7	139	-1.838	0.420
8	144	-1.671	0.398
9	149	-1.519	0.381
10	153	-1.380	0.366
11	158	-1.250	0.354
12	161	-1.128	0.343
13	165	-1.014	0.334
14	168	-0.904	0.327
15	172	-0.800	0.320
16	175	-0.700	0.314
17	178	-0.603	0.309
18	181	-0.509	0.304
19	184	-0.418	0.300
20	187	-0.329	0.297
21	189	-0.242	0.294
22	192	-0.156	0.292
23	195	-0.071	0.290
24	197	0.013	0.289
25	200	0.097	0.289
26	203	0.180	0.288
27	205	0.263	0.289
28	208	0.347	0.290
29	211	0.431	0.291
30	213	0.517	0.294
31	216	0.604	0.296
32	219	0.692	0.300
33	222	0.784	0.304
34	225	0.878	0.309
35	228	0.975	0.315
36	231	1.077	0.322
37	234	1.183	0.331
38	238	1.295	0.340
39	242	1.415	0.351
40	246	1.543	0.365
41	250	1.682	0.380
42	255	1.833	0.399
43	260	2.001	0.422
44	266	2.191	0.450
45	273	2.410	0.487
46	281	2.671	0.537
47	292	2.998	0.611
48	300	3.444	0.736
49	300	4.179	1.021
50	300	5.414	1.838

Math Grade 7 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.412	1.836
1	100	-4.181	1.019
2	100	-3.449	0.734
3	100	-3.005	0.610
4	100	-2.678	0.538
5	109	-2.414	0.490
6	116	-2.192	0.455
7	123	-1.996	0.429
8	129	-1.821	0.408
9	134	-1.662	0.392
10	139	-1.514	0.378
11	144	-1.376	0.366
12	148	-1.245	0.357
13	152	-1.121	0.348
14	156	-1.002	0.341
15	160	-0.888	0.335
16	164	-0.778	0.329
17	168	-0.671	0.324
18	171	-0.567	0.320
19	175	-0.466	0.316
20	178	-0.367	0.313
21	181	-0.270	0.310
22	184	-0.174	0.308
23	188	-0.080	0.305
24	191	0.012	0.303
25	194	0.104	0.302
26	197	0.195	0.301
27	200	0.285	0.300
28	203	0.374	0.299
29	206	0.463	0.299
30	209	0.553	0.299
31	212	0.642	0.300
32	215	0.732	0.301
33	218	0.823	0.302
34	221	0.915	0.305
35	225	1.009	0.308
36	228	1.104	0.311
37	231	1.203	0.316
38	235	1.305	0.322
39	238	1.410	0.329
40	242	1.521	0.337
41	246	1.638	0.347
42	250	1.762	0.359
43	255	1.896	0.373
44	259	2.041	0.390
45	265	2.202	0.412
46	271	2.383	0.440
47	278	2.592	0.476
48	287	2.841	0.526
49	297	3.155	0.600
50	300	3.587	0.726
51	300	4.307	1.013
52	300	5.529	1.833

Math Grade 8 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.348	1.837
1	100	-4.116	1.019
2	100	-3.384	0.734
3	100	-2.941	0.609
4	100	-2.615	0.536
5	101	-2.355	0.487
6	109	-2.136	0.451
7	116	-1.946	0.423
8	122	-1.776	0.401
9	128	-1.623	0.383
10	133	-1.482	0.368
11	138	-1.351	0.356
12	142	-1.228	0.345
13	147	-1.112	0.336
14	151	-1.002	0.328
15	155	-0.896	0.321
16	158	-0.795	0.316
17	162	-0.697	0.310
18	165	-0.602	0.306
19	169	-0.509	0.302
20	172	-0.419	0.299
21	175	-0.330	0.297
22	178	-0.243	0.295
23	181	-0.156	0.293
24	185	-0.071	0.292
25	188	0.014	0.291
26	191	0.099	0.291
27	194	0.183	0.290
28	197	0.267	0.290
29	200	0.352	0.291
30	203	0.437	0.291
31	206	0.522	0.292
32	209	0.608	0.294
33	212	0.694	0.295
34	216	0.782	0.297
35	219	0.871	0.300
36	222	0.962	0.303
37	226	1.055	0.308
38	229	1.151	0.313
39	233	1.252	0.321
40	237	1.357	0.330
41	241	1.470	0.341
42	245	1.591	0.355
43	250	1.724	0.373
44	255	1.870	0.394
45	261	2.036	0.420
46	268	2.226	0.453
47	276	2.450	0.495
48	286	2.722	0.551
49	299	3.069	0.631
50	300	3.547	0.763
51	300	4.334	1.052
52	300	5.621	1.861

Science Grade 8 2008 Operational

Raw Sc.	Scale Sc.	Theta	S.E.	Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.002	1.832	51	300	3.216	0.606
1	100	-3.781	1.012	52	300	3.657	0.733
2	104	-3.063	0.725	53	300	4.390	1.021
3	118	-2.632	0.599	54	300	5.625	1.838
4	129	-2.319	0.525				
5	137	-2.070	0.476				
6	144	-1.861	0.440				
7	150	-1.680	0.413				
8	156	-1.518	0.391				
9	161	-1.373	0.373				
10	165	-1.239	0.359				
11	169	-1.114	0.347				
12	173	-0.997	0.337				
13	177	-0.887	0.328				
14	180	-0.782	0.320				
15	184	-0.681	0.314				
16	187	-0.585	0.308				
17	190	-0.491	0.303				
18	193	-0.400	0.299				
19	196	-0.312	0.295				
20	200	-0.226	0.292				
21	202	-0.141	0.289				
22	205	-0.058	0.287				
23	208	0.023	0.285				
24	211	0.104	0.283				
25	214	0.184	0.282				
26	216	0.263	0.280				
27	219	0.341	0.280				
28	222	0.419	0.279				
29	225	0.497	0.279				
30	227	0.574	0.279				
31	230	0.652	0.279				
32	233	0.730	0.280				
33	236	0.809	0.281				
34	239	0.888	0.283				
35	241	0.969	0.285				
36	244	1.051	0.288				
37	247	1.135	0.292				
38	250	1.221	0.296				
39	253	1.310	0.301				
40	257	1.403	0.308				
41	260	1.500	0.316				
42	264	1.603	0.325				
43	267	1.712	0.336				
44	272	1.830	0.350				
45	276	1.957	0.366				
46	281	2.098	0.385				
47	287	2.256	0.409				
48	293	2.435	0.439				
49	300	2.644	0.477				
50	300	2.896	0.530				

Math Grade 5 2008 Braille

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.406	1.838
1	100	-4.170	1.023
2	100	-3.431	0.739
3	100	-2.979	0.616
4	110	-2.645	0.545
5	119	-2.375	0.497
6	126	-2.146	0.462
7	133	-1.944	0.436
8	139	-1.763	0.416
9	144	-1.598	0.399
10	149	-1.444	0.385
11	154	-1.301	0.373
12	158	-1.165	0.363
13	162	-1.036	0.355
14	166	-0.913	0.347
15	170	-0.795	0.341
16	173	-0.681	0.335
17	177	-0.570	0.331
18	180	-0.462	0.327
19	184	-0.356	0.323
20	187	-0.253	0.321
21	190	-0.151	0.318
22	194	-0.050	0.317
23	197	0.050	0.316
24	200	0.150	0.315
25	203	0.249	0.315
26	207	0.349	0.316
27	210	0.448	0.316
28	213	0.549	0.318
29	216	0.650	0.319
30	220	0.753	0.321
31	223	0.857	0.324
32	226	0.963	0.327
33	230	1.071	0.331
34	233	1.182	0.336
35	237	1.297	0.342
36	241	1.416	0.349
37	245	1.541	0.359
38	250	1.675	0.371
39	254	1.818	0.387
40	259	1.976	0.407
41	264	2.152	0.434
42	271	2.356	0.470
43	279	2.599	0.520
44	289	2.907	0.595
45	300	3.333	0.722
46	300	4.048	1.011
47	300	5.267	1.832

Math Grade 6 2008 Braille

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.204	1.830
1	100	-3.989	1.008
2	100	-3.279	0.719
3	107	-2.855	0.593
4	117	-2.549	0.519
5	124	-2.306	0.470
6	131	-2.102	0.435
7	136	-1.924	0.409
8	141	-1.765	0.388
9	146	-1.621	0.372
10	150	-1.487	0.359
11	154	-1.362	0.349
12	158	-1.243	0.340
13	161	-1.130	0.333
14	165	-1.021	0.327
15	168	-0.916	0.322
16	171	-0.813	0.318
17	174	-0.713	0.315
18	178	-0.614	0.313
19	181	-0.517	0.311
20	184	-0.420	0.310
21	187	-0.325	0.309
22	190	-0.229	0.309
23	193	-0.133	0.310
24	196	-0.036	0.311
25	200	0.061	0.313
26	202	0.159	0.315
27	205	0.259	0.317
28	208	0.361	0.321
29	212	0.464	0.324
30	215	0.571	0.329
31	218	0.681	0.334
32	222	0.795	0.340
33	226	0.913	0.348
34	230	1.037	0.356
35	234	1.167	0.366
36	238	1.305	0.378
37	243	1.453	0.392
38	250	1.612	0.408
39	253	1.788	0.429
40	260	1.983	0.456
41	267	2.207	0.491
42	275	2.471	0.539
43	285	2.799	0.611
44	299	3.245	0.735
45	300	3.978	1.020
46	300	5.210	1.837

Math Grade 7 2008 Braille

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.404	1.836
1	100	-4.173	1.018
2	100	-3.441	0.733
3	100	-2.996	0.610
4	100	-2.668	0.537
5	109	-2.404	0.489
6	117	-2.180	0.454
7	123	-1.984	0.428
8	129	-1.807	0.407
9	135	-1.646	0.391
10	140	-1.497	0.377
11	144	-1.357	0.366
12	149	-1.225	0.356
13	153	-1.099	0.348
14	157	-0.978	0.341
15	161	-0.862	0.335
16	165	-0.749	0.330
17	169	-0.640	0.325
18	172	-0.533	0.322
19	176	-0.428	0.318
20	179	-0.325	0.316
21	183	-0.224	0.313
22	186	-0.124	0.311
23	190	-0.025	0.310
24	193	0.073	0.309
25	196	0.170	0.308
26	200	0.267	0.308
27	203	0.364	0.308
28	206	0.462	0.308
29	209	0.559	0.310
30	213	0.657	0.311
31	216	0.756	0.313
32	219	0.857	0.316
33	223	0.960	0.320
34	226	1.065	0.325
35	230	1.173	0.330
36	234	1.285	0.337
37	238	1.401	0.345
38	242	1.524	0.354
39	250	1.653	0.366
40	251	1.792	0.379
41	256	1.943	0.396
42	262	2.108	0.418
43	268	2.294	0.445
44	275	2.507	0.480
45	284	2.760	0.529
46	295	3.078	0.603
47	300	3.513	0.728
48	300	4.236	1.015
49	300	5.461	1.834

Math Grade 8 2008 Braille

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-5.335	1.837
1	100	-4.102	1.019
2	100	-3.369	0.734
3	100	-2.924	0.609
4	100	-2.597	0.536
5	102	-2.335	0.487
6	110	-2.114	0.451
7	117	-1.921	0.423
8	123	-1.750	0.401
9	129	-1.594	0.383
10	134	-1.450	0.368
11	139	-1.316	0.356
12	144	-1.191	0.345
13	148	-1.072	0.336
14	152	-0.958	0.328
15	156	-0.850	0.321
16	160	-0.745	0.316
17	164	-0.643	0.310
18	167	-0.544	0.306
19	171	-0.447	0.302
20	174	-0.352	0.299
21	178	-0.259	0.297
22	181	-0.167	0.295
23	184	-0.076	0.293
24	188	0.015	0.292
25	191	0.105	0.291
26	194	0.195	0.291
27	198	0.285	0.290
28	200	0.375	0.290
29	204	0.466	0.291
30	207	0.556	0.291
31	211	0.648	0.292
32	214	0.740	0.294
33	218	0.833	0.295
34	221	0.928	0.297
35	225	1.025	0.300
36	228	1.125	0.303
37	232	1.229	0.308
38	236	1.339	0.313
39	240	1.456	0.321
40	245	1.581	0.330
41	250	1.720	0.341
42	255	1.874	0.355
43	262	2.049	0.373
44	269	2.255	0.394
45	278	2.502	0.420
46	290	2.816	0.453
47	300	3.249	0.495
48	300	3.972	0.551
49	300	5.197	0.631

Science Grade 8 2008 Braille

Raw Sc.	Scale Sc.	Theta	S.E.
0	100	-4.965	1.831
1	100	-3.748	1.009
2	105	-3.036	0.720
3	119	-2.612	0.593
4	129	-2.306	0.518
5	137	-2.065	0.467
6	144	-1.864	0.430
7	150	-1.692	0.402
8	155	-1.540	0.379
9	159	-1.403	0.361
10	164	-1.278	0.346
11	168	-1.163	0.333
12	171	-1.056	0.323
13	175	-0.954	0.314
14	178	-0.858	0.307
15	181	-0.765	0.301
16	184	-0.676	0.296
17	187	-0.589	0.292
18	190	-0.505	0.289
19	193	-0.422	0.287
20	196	-0.340	0.286
21	200	-0.259	0.285
22	201	-0.178	0.284
23	204	-0.097	0.284
24	207	-0.016	0.285
25	210	0.065	0.286
26	212	0.148	0.287
27	215	0.231	0.289
28	218	0.315	0.292
29	221	0.401	0.294
30	224	0.488	0.298
31	228	0.578	0.301
32	231	0.670	0.306
33	234	0.765	0.311
34	238	0.863	0.316
35	241	0.965	0.323
36	245	1.072	0.330
37	250	1.184	0.339
38	253	1.302	0.349
39	258	1.428	0.361
40	262	1.564	0.376
41	267	1.712	0.393
42	273	1.874	0.415
43	280	2.057	0.442
44	287	2.268	0.478
45	296	2.519	0.527
46	300	2.834	0.601
47	300	3.267	0.726
48	300	3.987	1.013
49	300	5.209	1.833